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THE

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Part First.

ORIGINAL COMMUNICATIONS.

Article I.—*Polypus of the Uterus.* By J. Matthews Duncan, M.D.

This is a well-known disease peculiar to women, and of great importance, from the loss of blood which it frequently occasions. Malignant polypi are rare, and of such I shall at present say nothing. Ordinary polypi may be of three different kinds: mucous, fibrous, and fibrinous.

Mucous polypi are most frequent. Amongst sixty-six cases of polypus, of which I have kept notes during several recent years, I find forty-one belong to the class of mucous polypi. Among them I found varieties. Several were single cysts, probably enlarged Nabothian follicles. Such polypi, bursting when compressed by the forceps, leave only their thin walls between the blades, to represent a growth, which may have been as large as a pea or a field bean. Many were simple outgrowths of mucous membrane, like the polypi so frequent in the nose. These were all of small size, rarely equalling in bulk the terminal phalanx of the little finger. Ten of the forty-one mucous polypi were of a kind that is often called glandular. These were sometimes as large as a walnut, and presented on their surface several large apertures, from which exuded viscid mucus, like that of the cervix uteri. These apertures communicated with variously-shaped cavities in the interior of the polypus, which sometimes also communicated one with another; the whole mass evidently consisting of hypertrophied cervical glands. One of these glandular polypi was long and narrow, of the kind called by some a pendulum polypus. A few of the forty-one mucous polypi were fibro-cellular, formed of a layer of mucous membrane, enclosing a mass of loose connective tissue, whose fibres had no definite arrangement. The largest of these was about the size of a small walnut, and was connected with the cervix of a uterus that contained a small fibroid.

These mucous polypi were all attached to some part of the cervix uteri, except one, about the size of a pea, which bled freely, and which was attached to the mucous membrane of the body of the uterus. The great majority of them were easily felt by the examining finger. Some glandular polypi were so soft, glabrous, and mobile as to escape detection in a large vagina when the examiner was inexperienced. Some small ones were concealed within the cervix, whose external os required dilatation for their discovery. Sometimes little ones were hidden in the cervix behind a bigger one, which obstructed the passage of the finger to the more distant and smaller.

On several occasions, these mucous polypi occurred as complications of pregnancy, of fibrous tumour, and of prolapsus.

I have a specimen of a remarkable polypus, attached to the upper part of the cervix, which pursued an extraordinary course. Instead of growing downwards into the cervix and then into the vagina, it has grown upwards into the body of the uterus, which it distends; its bulk being that of a common boy's marble.

The fibrous polypi were, like the mucous class, of various kinds. Among the sixty-six polypi already referred to, twenty-two were fibrous.

Of these, one, nearly as large as an egg, with a thick pedicle, having a considerable artery pulsating in it, was a continuous outgrowth. It complicated pregnancy and gave rise to bloody discharge. It was attached to the cervix. A second smaller one of this kind occurred among the sixty-six. It complicated prolapsus uteri.

Sixteen were true fibrous polypi; that is, they consisted of a fibrous tumour of the uterus, enclosed within a capsule of proper uterine muscular tissue, which generally was thin, sometimes absent at the most prominent part, and gradually thickened as the stalk was approached; the whole being invested in a layer of mucous membrane. In some of them, venous canals could be seen beneath the mucous membrane, and in some these canals seemed to open on the surface. In one profusely bleeding fibrous polypus, there were distinct venous openings on the most dependent part of the polypus, and further communication could be traced between these venous canals and a series of cavities, in the substance of the fibroid, which were filled with old fluid blood, more or less brown or decolorized. Another of these polypi, about the size of an egg, complicating pregnancy, but giving rise to no hæmorrhage, was attached to the margin of the os uteri by a large base. The rest had their attachments more or less deeply within the cervix, or even still higher up. The smallest of the sixteen true fibrous polypi was of the size of a walnut, the largest as big as a closed fist; but I have seen one nearly as large as an adult fœtal head. True fibrous polypi do not always owe their size exclusively to their constituents already named—mucous membrane, muscular capsule, and fibrous tumour proper; but may be greatly swollen out by œdema. In one case where the polypus was equal in size to a large orange, and attached to the cervix, the tissues between the mucous membrane and the contained fibroid were distended by transparent watery fluid so as to be at the lower part of the polypus nearly an inch thick. This œdema does not necessarily depend upon the position of the fibroid, for it is sometimes seen, in an extreme degree, in large embedded fibroids of the body of the uterus. I have seen an enormous succulent fibroid of this kind discharge, on being tapped, several ounces of thin watery fluid tinged with blood; and this tendency to œdema may in part account for the watery discharges from uterine fibroids, whether polypi or embedded.

Authors systematically describe true fibrous polypi as being frequently produced by extrusion from the uterine wall; that is, an embedded uterine fibroid is said to become a pediculated true fibrous polypus. I cannot deny that this process occurs, but I have never observed it, nor have I read any detailed circumstantial report of its actual occurrence. No doubt, a polypus may change its position. As it grows, it may ascend from its insertion up into the cavity of the body of the uterus. I have a preparation demonstrating this curious direction of growth. Most polypi descend. I have observed a large polypus descend during menstruation, and ascend after it ceased, so completely that it could not be felt. Such change of position may naturally give rise to belief in the extrusion of a fibroid from the uterine wall, and the formation in this way of a true fibrous polypus. My own impression is, that at least the great majority of polypi are more or less protuberant from their first beginning. This opinion may be otherwise stated, by saying that I believe it improbable, as it is certainly not proved, that an embedded fibroid becomes first a protuberant or polypoid fibroid, and lastly a true stalked polypus. On the other hand, I have repeatedly seen an embedded fibroid become a false fibrous polypus.

Of the twenty-two fibrous polypi, four were false fibrous polypi, as I denominate them. Three of them were naked fibroids lying in the vagina, and attached to the uterus only by a small part of their surface. One, of enormous size, was only partially denuded of its investments, and might, with propriety, be excluded from among polypi; with this exception, the false fibrous polypi were just spontaneously enucleated fibrous tumours, whose still remaining connexions with the fibrous tissue of the uterus formed their false pedicles. It is, I believe, polypi of this kind that have given rise to the common belief in the formation of true fibrous polypi, by extrusion of a still invested fibroid from the uterine wall. All these false fibrous polypi were large; two of them about the size of a fœtal head. The largest of them was certainly attached high in the body of the uterus; the attachment of the other was not exactly made out.

The three fibrinous polypi occurred in the puerperal state. The smallest was equal in size to a garden cherry, the largest to a plover's egg. The fact of their containing chorionic structures near their insertion showed that they were attached to the site of the placenta, and explained their production according to accepted pathological views.

A polypus has no essential symptoms, if we distinguish symptoms from signs. Many polypi, indeed most, excluding the false fibrous and the fibrinous, have neither symptoms nor signs attracting attention. A woman may have a large true fibrous polypus without herself or her physician having the slightest reason to suspect its presence. Among the sixty-six cases of polypi to which we have referred, a large proportion was discovered in a purely accidental manner. Among these were numerous polypi of various kinds; and at least one was a true fibrous polypus.

I know no symptoms of uterine polypus worthy of description. No doubt, various kinds of pain or uneasiness may be caused by them, but there is nothing distinctive in these sensations. Nor have I observed any sympathetic phenomena that I could satisfactorily refer to this cause. When the polypus is large, its mere bulk may cause annoyance: for example, a large false fibrous polypus descending produced, in one of my cases, retention of urine, and this was the first indication of its presence.

The great sign of polypus is that loss of blood which is the main source of the importance of the disease. This hæmorrhage may be menorrhagic—that is, occurring at the menstrual periods; but it may be incessant, or it may be accidental, occurring at any time. It is also highly important to remark that a polypus may exist without any hæmorrhage whatever, and even grow while there is suppression of the menses, or while the menstrual flow is gradually getting scantier. I have never seen a false fibrous polypus, or a fibrinous polypus, which was not at some time or other the cause of bloody discharge. But the frequency, and therefore the importance, of bloody discharge or hæmorrhage has been generally very much exaggerated by describers. Among the forty-one mucous polypi to which I have already referred, nineteen, or about a half, caused no extraordinary loss of blood whatever; while in several there was less than ordinary loss, and in some none of any kind.

It is rare to find considerable loss of blood produced by a small polypus, but I have observed it. The largest losses dangerous to life, which I have seen, were produced by true fibrous polypi, or by false fibrous polypi, which were undergoing extrusion from the uterine wall. In only one of the twenty-two fibrous polypi was there no extraordinary loss of blood.

When a mucous polypus causes serious loss of blood or anæmia, it does so, not by a flooding or in a short time, but by constant or nearly constant slight oozing. Of course, to produce anæmia, the oozing must [illegible] to an amount greater than the system can repair as fast as it flows. On the other hand, bleeding from a fibrous polypus is generally more profuse; sometimes it deserves the name of a flooding. I have seen a woman's life in imminent danger from a single flooding in a case of true fibrous polypus, and it is not rare to observe cases where two or three hæmorrhages have produced the most aggravated anæmia and all its painful consequences. Mucous polypi comparatively seldom, and comparatively slowly, produce extreme anæmia. Among the sixty-six cases to which I have been referring as mostly occurring recently in my practice, none proved fatal. In more than one it was my opinion that life could not have been much prolonged if an operation had not been performed. My impression, founded on experience, is that death from bleeding in a case of polypus is much more uncommon than in a case of ordinary fibrous tumour.

Besides blood, mucous or muco-purulent fluid is frequently discharged from the vagina in cases of polypus. Such discharge may be of the nature of a simple vaginal or cervical uterine leucorrhœa, or it may be produced by superficial ulceration of the polypus or of the cervix uteri.

In cases of fibrous polypi, whether true or false, there is frequently a more or less copious watery discharge, of a more irritating kind than the ordinary leucorrhœal discharge, and sometimes to such an extent as to be weakening.

A woman can never be said to have a polypus unless the practitioner has either felt or seen it; in most cases he can easily both see and feel it. A mucous polypus is generally soft and rounded, but it may be dense and have various shapes. To the eye it generally presents a darker red tint than the neighbouring parts, as also does a fibrous polypus. Sometimes a true fibrous polypus is hard and nodulated, and of a very pale or yellowish white colour.

A false fibrous polypus is hard, nodulated, and very pale in colour, except occasionally, when it is much soiled by long lying in the genital passages. A true fibrous polypus is not always hard. When it is œdematous, it may be soft, and even deceive the practitioner, causing him to believe that he has to do with a bag of fluid. A fibrinous polypus may be broken down by the finger, disrupting its outer fibrinous wall.

Polypi certainly have no sensitiveness, and at least generally no sensation.

When a practitioner suspects the existence of polypus, and yet, on a vaginal examination, does not find it, he has to consider whether he will further pursue the search for it. If this further search is merely carried the length of dilating the external os uteri, the practitioner may proceed without any anxiety. But if he proposes to dilate the whole length of the cervix for the passage of his examining finger, he must proceed with the greatest circumspection.

For the exploratory operation may itself be injurious, even more so than the disease which is as yet only suspected to exist. Metritis, ovaritis, perimetritis, parametritis, are frequent results of this exploration, and death itself may be a consequence. I entertain a belief—of which, however, I have no sufficient evidence—that the forcible dilatation of the cervix uteri, in cases whose upshot shows that it was required, is not nearly so liable to be followed by untoward accidents as when it is done in cases which turn out not to have required it. Similar statements have been frequently made as to other dangerous remedies, and a so-called law of toleration, founded on such facts or fancies, has been enunciated.

It is very rarely, indeed, that dilatation of the whole cervix is required. In only one of the sixty-six cases was it resorted to in order to discover the disease.

Dilatation is effected by means of a tangle-tent. Sometimes a small one may be first used to begin the dilatation; and after it has done all in its power, or in about twenty-four hours, it is replaced by a larger; and again, by one even still larger. The tent, with a string attached to its lower end, is seized by a vaginal forceps, or throat forceps, and passed into the uterus. It is well to introduce a small sponge into the vagina to keep it *in situ.* It is removed by pulling the string attached to its lower end. After the removal of the tent, the index-finger of one hand is passed into and through the cervix, while the other hand, pressing on the abdomen above the pubes, pushes the womb downwards upon the examining finger.

Besides this kind of exploration, very little is required in the way of diagnosing a polypus. A cauliflower excrescence has a rough surface, friable texture, a broad attachment, constant fleshwater discharge, and free bleeding when handled; characters which a polypus does not present. Chronic inversion of the uterus—a very rare affection—may cause a little more difficulty than a cauliflower excrescence. It is to be distinguished by the following points: its history, its occasional sensitiveness, its regularity of form, the largeness of the part which may be mistaken for a pedicle, the absence of the body of the uterus in its natural situation, and the impossibility of passing far up a probe at any part between the cervix uteri and the suspected pedicle. But it is a general rule that a complication or complications are the cause of extraordinary difficulty in diagnosis; and the practitioner must remember that a polypus may complicate an inversion of the uterus.

There is nothing simpler than to tell what should be done in a case of polypus. It should be removed.

In most cases the operation is very easy. A small mucous polypus may be removed by torsion. It, or its pedicle, is seized by an appropriate long forceps, and, by twisting, removed or divided. This little operation may be done with the aid of a speculum or without it. When the polypus is not very small, exceeding in size the phalanx of a small finger, it is best to clip through the pedicle of the polypus by an appropriate curved scissors. When the polypus is not large, and the woman has borne a child, the duck-bill speculum may be used to expose the polypus with a view to the operation; but it is generally convenient to dispense with a speculum of any kind. The operation may be done without an assistant, but it is better to have one. The operator seizes the polypus with a volsella in order to fix it, and in order in some cases also to pull it nearer the os vaginæ. The operator then guides an appropriate curved scissors by the fingers of one hand to the stalk of the polypus. His other hand holding the scissors makes it grasp and cut the pedicle. A pretty long curved scissors is generally used, but most such instruments are badly made, the cutting parts being too long and weak, in consequence of which they yield and disappoint the operator by refusing to cut. This error, however, is easily corrected by any cutler.

Instruments have been invented for cutting through the pedicle of a polypus, but they are illustrations of misplaced ingenuity. There is no difficulty in cutting through the pedicle of any polypus, and nothing is better for the purpose than a bistoury or an appropriate scissors. There is occasionally difficulty in reaching the stalk of a polypus, but no instrument for dividing the stalk will facilitate this part of the operation. A bistoury or a scissors will reach the stalk, if it be accessible, better than any other instrument.

The operator, in the case of a large polypus, may find the operation of removal very difficult. The difficulty lies, not in dividing the pedicle, but in getting sufficient access to it. In the case of an enormous polypus, where the difficulty is greatest, the division of the pedicle, if it could be effected as a preliminary to the operation of removal of the polypus, would make little difference in the difficulty of doing so. In a case of this kind, the difficulty is almost exactly that of delivering a fœtal head through a contracted outlet or over a rigid perineum. In both cases the perineum is likely to be torn, and sometimes the laceration extends even through the sphincter ani.

In cases of false fibrous polypi, the operator not unfrequently finds it unnecessary formally to divide the pedicle at all. Having fixed one or two volsellæ in the tumour to pull it through the os vaginæ, he finds, when the birth of the tumour is effected, that the false pedicle is also divided. I have never seen this happen with the true pedicle of a true fibrous polypus. On examining a false fibrous polypus after it has been removed in the way described, it is easy to distinguish the recently separated connexions from the rest of the surface of the tumour which has been for some time lying bare in the genital passages.

The ordinary operation, in the case of a large polypus, consists in fixing one or more volsellæ in the polypus, dragging it forwards through the orifice of the vagina, and then cutting through the pedicle as soon as it can be reached. If the pedicle be short, this dragging down involves considerable displacement of the uterus; but really the displacement is not very great, if the shortest route for the cervix uteri—that is, following the direction of the anterior wall of the vagina—is pursued. The stalk of a polypus does not require to be cut off; it shrinks and soon disappears.

As already said, the difficulty of operating for an enormous polypus is sometimes very great, and the difficulty consists in getting it out of the vagina. The getting access to the pedicle is a matter of comparatively little importance. Yet when the pedicle is reached all the difficulties of the operation are past, not because the pedicle is reached, but because the bulk of the tumour is extracted from the vagina. Many plans have been proposed for facilitating the extraction—such as cutting out a wedge-shaped portion of the accessible part of the tumour, or cutting the tumour spirally, as it is called. But these plans have an appearance of precision which I have been unable to imitate. I proceed on a simpler plan, removing portion after portion of the tumour, and this, if possible, in such a way as always to leave a convenient bit of the tumour projecting from the remaining part, by which piece a good hold is got for pulling the tumour further down. So, bit by bit, the whole is removed.

A fibrinous polypus may come away spontaneously; or it may be detached and removed by the finger, used in a hook-like manner, as the obstetrician frequently employs it to remove early abortions; or it may be broken up and pulled away by a forceps.

After removing any kind of polypus, no bleeding is to be expected. In a case of small mucous polypus, or false fibrous polypus, or fibrinous polypus, I have never seen bleeding follow the operation of removal. After the numerous operations for polypi which I have performed, including those of the sixty-six cases referred to in this paper, I have not once seen an alarming hæmorrhage, and I make it a rule not to plug the vagina after the operation, or do anything to restrain, except keeping the patient in the horizontal position. But I have seen a few times—certainly not five—an amount of bleeding which rendered hæmostatic measures expedient. In all of them, the bleeding began at the time of the operation, except in one case of fibrous polypus, where it was delayed till a few hours after the operation. In a case of mucous polypus where bleeding occurred, the pulsation of an artery in the stalk could be easily felt, and the large vessel was subsequently seen in the removed portion of the pedicle. In all of the cases a very gentle plugging of the vagina was sufficient to arrest the hæmorrhage.

Fear of hæmorrhage after the operation, and anticipated difficulty in severing the pedicle, have been for a long time, and to a great extent still are, bugbears of gynæcologists, and have led to considerable sacrifice of life from their inducing operators to resort to bad methods. I lately removed a large true fibrous polypus in the

Royal Infirmary from a patient who, immediately after the operation, insisted upon returning home to a great distance by railway, and who never had any further trouble or confinement from the disease. This simple operation was witnessed by a stranger, who had recently seen a similar operation in a large hospital done by aid of Gooch's canula. The woman was a fortnight in bed, and at one time her life was considered to be in danger. The contrast of the results of these cases is not only fair, but might be made infinitely more striking by taking, instead of the second case, one of the numerous cases where strangling the neck of the polypus has proved fatal to the woman. A great variety of instruments has been invented for the purpose. I recommend the disuse of them all. The procedure is slow and clumsy, and should be rejected on these accounts, even were there no danger to life from the sloughing and other processes consequent on the strangulation of the pedicle.

It is scarcely necessary to say anything of the palliative treatment of hæmorrhage in a case of polypus, for this is a temporizing which, under any combination of circumstances, can scarcely ever be required. Such palliative treatment I shall dismiss with a very few words; for it is the same as is adopted in menorrhagia, and it is equally efficient,—a statement which, however ironical, is yet true. He would be a bold physician who would dare in any case to predict that any palliative would have the desired effect. The mere number and variety of such hemostatic remedies, recommended as they are in menorrhagia, and in the bleedings of fibrous tumours, is to the thoughtful physician good presumptive evidence that they are all pretty inefficient. Practitioners delight in them, and in changing from one to another. The patients are probably at least as credulous as the physicians, and are comforted.

I have never used in a case of polypus the local application of solution of perchloride of iron. But this, if required, would probably be as efficient as in the ordinary alarming bleeding from a fibroid.

ARTICLE II.—*Carbolic Acid, from a Septic Point of View.* By J. MILNER FOTHERGILL, M.D., Leeds.

THIS essay is perhaps essentially speculative; and yet it will be found to group a series of known facts in a relationship hitherto unrecognised, and has a distinctly practical bearing. It assumes that, as a matter of fact, the success of Lister's antiseptic treatment is unquestionable in the hands of any one who has tried it with the intention and capacity to test it fairly. It has not yet fulfilled all expectations, but still many limbs are now conserved, with such intention from the first, where previous to the introduction of this treatment amputation would never have been questioned even. In operations necessitating the laying open of joints, in severe compound smashes, in resection of joints, and to a very considerable extent in amputations, the effect of antiseptic treatment has been so marked as to leave no doubt that the results were something more than mere coincidences. Admitting that, in many instances, results have not been much different from what they have been under the old treatment, what we have to do is to see what light these failures throw on the much more numerous cases where a success which could not have been dreamt of even before has been attained. The conditions to be complied with, in order to attain success, have never been underrated by Professor Lister himself; and the vigorous compliance with his instructions which he demands from experimenters, is only such as he can fairly demand in justice to himself. But there is one condition on which he insists as of vital importance, and that is the existence of germs. This, he insists, is a *sine qua non;* and some such belief is no doubt requisite, in order to prevail on operators to observe the practically important conditions requisite for success. But with all due respect to Professor Lister, there is no doubt that this dogma, planted across the threshold of the inquiry, has turned away many who would have otherwise been induced to try the treatment for themselves. It enabled the mind which felt inclined to support the negative to take up an objection to start with, which has never been satisfactorily disposed of. The germs are undemonstrated, and the full-grown organisms to which they belong are undiscovered; and even yet, in the multitude of cases of free suppuration lasting for months, to which germs have had free access, the germ-bearing organism is unknown to microscopists. In the firm conviction, then, that the germ theory has had an unfortunate influence over the growth of antiseptic treatment, the writer proposes to consider the whole question without reference to germs, and to substitute for germs what appears to him a more correct etiology. And it may be here stated, that the elaborate experiments of Professor Lister just prove as much in favour of minute organic particles floating about in the air, slowly oxidizing to their ultimate constituents, as they do in favour of germs. It would be a waste of time to go over, even in the most cursory manner, these experiments; as to those who have attentively watched the controversy it would be unnecessary, and to those who have not, any review possible here would be utterly insufficient to give any fair conception of them. The view of oxidizing particles is the one now held by many of the most attentive observers who are converted to the practice of antiseptic surgery, and yet cannot accept its primary dogma. But we must remember that there is something more in the question than the granting of some sepsis-producing external agents. Long before the days of antiseptics proper cases of compound smashes, chronic abscesses, etc., now and then did as well as ever any cases under antiseptics have done, but unfortunately they were very rare. And yet if the introduction of foreign agents is so very easy, and forms one of the greatest causes of anxiety with the antiseptic dresser, and is so certainly followed by disastrous consequences, how in the name of reason are these cases possibilities at all? The cases were very rare, but antiseptics have enabled us to produce them almost, but not quite, at will. And why not always? That is a question which lies far behind a great deal which we have yet to know! All that antiseptics enable us to do is to place a number of cases, which would have certainly gone to the bad without them, into as favourable a position as the rare case which does splendidly without an antiseptic whiff near it. This is all that can be claimed for antiseptics: and practically it is no slight matter. In considering how antiseptics achieve this very desirable result, we must admit that they must exercise an antiseptic influence either over the fluids of the body themselves, or over certain organic particles conveyed by the atmosphere—perhaps over both. The consideration of the first half will probably give us much enlightenment as to the action over the second half. The fluids of the body, and notably the blood, contain not merely organized material for histogenetic purposes, but, what is the important matter here, the products of histolysis gradually passing onward to water, carbonic acid, and urea. But manifold changes go on, and various substances are formed, as the starch and protagon principles pass through the different stages before they are thus again converted into simple bodies and excreted. What various forms are assumed by retrograde metamorphosis of muscular fibre, are only known to the physiological chemist. Certain it is that, while the blood contains the future nutriment of the tissues, it also holds this waste; it is a vast system of sewage in this respect. This is well known to those who furnish us with our animal food, and a needful amount of hungering has been found indispensable to the "keeping" of meat after slaughter. When an animal has been over-driven, even the ordinary amount of hungering often fails, because an extra amount of waste has been created. Hares that have been coursed are soon high; and bullbaiting arose from an economical view of rendering bulls eatable. Venison from deer that have been hunted is also an unsafe article of diet, unless quickly consumed. This may apparently have very little to do with antiseptic surgery, and yet it bears directly on the question of the difference between primary and secondary amputations. The overfed London drayman is notoriously a bad subject for operations, and even trivial wounds are followed in him by very serious consequences; and this can only be attributed to the condition of blood, to its being laden with effete material which is in excess, as the respired oxygen is consumed by the alcohol and other combustible material in which his blood abounds. On the other hand, those cases of smashes which have done so well under ordinary simple dressing, have been either spare and by no means overfed countrymen, or soldiers on the rations of a campaign. In these cases there has been a minimum of waste and a maximum of oxidation. So in the perfectly trained prize-fighter of past days, his bruises were well again directly. What, then, we attain by antiseptics is the placing of our ordinary less favourable cases in the same rank as these exceptionally favourable cases just given. A great deal of the benefit of antiseptic treatment lies under this heading, but not all of it; and more especially those cases treated in the more or less polluted atmosphere of palatial hospitals. External agents do unquestionably, in hospitals, interfere to prevent cases put under favourable circumstances for recovery from direct and primary union. Whether this is a germ or an oxidizing particle, a minute molecule of matter from some other organism on its road to resolution to its ultimate constituents, is practically of little moment if it did not bear on the first consideration. That there is no evidence in favour of germs, which is not equally potent in favour of the oxidizing molecules, I may re-assert, while the whole history of organic investigation is in favour of the latter. This little active ferment, then, comes in contact with the fluids exposed by wounds, and excites in them the same atomic activity which is going on in itself. This is borne out not only by the analogy of fermentation, but by the facts of common life. The farmer mixes his straw with less stable organic compounds undergoing retrograde metamorphosis, and amid the atomic activity the straw itself is "rotted." "In the process of decay, it has been likewise observed, a substance undergoing this state of elementary transposition exercises a remarkable influence upon the particles of an adjacent substance, which, *per se*, would not be capable of passing into the same state of change, decay, or transposition. Many substances, when in contact with another in the state of decay, manifest, at common temperatures, an affinity for oxygen; that is, they enter into combination with this element at this low temperature, whilst under other circumstances such a combination can only be effected by a far higher degree of heat. The state of active absorption of oxygen, the combustion of the decaying substance, is transmitted to the particles of other substances in contact with it: they assume its characteristic state of activity: they behave as if they formed part of the decaying body, and their combination with oxygen is effected in a manner not further explicable just as it is by heat."—*Liebig*. Thus we see that not only is atomic activity communicable to substances naturally inclined to unite with oxygen at common temperature, but even to those not so inclined. We can readily see, then, how exposure to the atmosphere causes the fluids of the body to at once assume a chemical activity—a putrefactive change, indeed. A compound fracture in an hospital with a tainted atmosphere—a chronic abscess opened and so exposed, almost invariably put on active suppuration,—a condition, as we shall see, closely allied with the presence of a chemical oxidizing tissue-irritant. A surface of unprotected tissues, necessarily injured in their molecular integrity by the force which has separated them from the parts removed from contact, is exposed to the contact of these minute molecules in active chemical change. A rise of temperature follows, falling again on the induction of free suppuration: this is the history of exposure to the atmosphere without a chemical protection, and that suppuration removes all hope of primary union. Tissue and fluids are at once exposed immediately, and no longer mediately, to the atmosphere: chemical change is at once facilitated in substances undergoing decay already, if minute chemical irritants are introduced to substances not in an active atomic movement. To attempt to classify each case after exposure would be simply absurd in a tentative essay like this. Even how far the ordinary atomic change is accelerated by contact with particles themselves in great atomic activity, can as yet only be a subject of speculation.

Certain it is, that these chemically active bodies act as tissue-irritants, and free suppuration is a conservative action, washing the tissues and removing the external irritant. Thus the more powerful the irritant, the more suppuration is set up to remove it. That the chemical irritant sets up chemical changes in the outer layer of pus is fully evidenced to the nose in a badly-dressed wound. But a fresh layer of pus-cells is being quickly formed beneath, and thus the tissues are saved from contact with the chemical irritant. Suppuration is not an unalloyed evil, as some modern writing would do more than hint. Pus-cells are merely nature's dressing, clumsy and terribly expensive. Pus in itself is harmless, is but an imperfect epidermal cell, and is not endowed with vitality, and as such is a ready prey to chemical agents. The formed material which constitutes the wall of the pus-cell is a famous ground for some oxidizing particle to transfer its own atomic activity. Pus, then, is not only very expensive dressing, but it is very imperfect, and very liable to putrefy at an early stage. So surgeons have come to think that the less pus the better—which simply means, that the less pus the more perfect their dressings have been, and thus less necessity for nature to use her dressing. Thus the amount of suppuration has been generally accepted as a valid test of the efficiency of surgical dressing. The presence of pus, too, is incompatible with primary union; and the appearance of pus at once announces that all hope of that must be given up.

Thus we see that tissues are self-protecting against these chemical irritants, whether of extrinsic or intrinsic origin, but at such a cost as is too frequently simply ruinous. The drain is exhausting; and free suppuration is a serious matter in itself. Pus is not only useful as against minute tissue-irritants, but if any doubt as to its use for such purpose existed, it would be removed by the suppuration round a foreign body or sequestrum. What surgeon of even limited experience has not had more than one opportunity of seeing a freely discharging sinus close and heal over in a few hours after the removal of the last speck of dead bone? Sheathing the tissues from the touch of this material irritant, with the removal of the cause goes the pus-producing activity of the tissues.

These oxidizing molecules of organic matter are not visible to the microscopist, it is true. But, nevertheless, their presence can be proved. Smell consists of the contact of the odorous particle with the Schneiderian membrane, and the oxidation of it gives the impression on the nerve; mere contact of a particle in chemical quiescence will not give it. But not all substances so oxidizing give the impression of smell; nor are odorous particles necessarily of a septic nature. But we all know how intimately a bad smell and putrefaction of animal products are associated. The use of antiseptics soon stops the smell. Do they also stop the atomic activity on which it depends, and with which it is allied? Again I must invoke the aid of the great master of chemistry. "There are indeed many, many bodies which oppose putrefaction and fermentation, and which impede or arrest the course of these processes; and this remarkable action frequently depends on their forming a chemical compound with the ferment. By the addition of a body having affinity to the ferment, the tendency of its particles to retain their original arrangement is obviously strengthened; for, in addition to the force which holds them in groups, we have, in the new body which combines with the ferment, a new attraction, which must be overcome before the atoms of groups of the ferment can change their position. To the list of bodies which check putrefaction and fermentation, or antiseptics, belong all substances which exert a chemical action on ferments; such as alkalies, mineral acids, concentrated vegetable acids, volatile oils, alcohol, sea salt."—*Liebig*. Thus, when we use an antiseptic to arrest a disagreeable smell, we see that it does so by arresting the chemical activity on which the smell depended. Thus the majority of antiseptics belong to this class. But Condy's fluid achieves the same end in an entirely different manner. Containing as it does ozonic oxygen in huge quantities, its contact with a putrefying body at once completes the oxidation. It is thus one of the best antiseptics, and for purifying the air of a room the antiseptic *par excellence.* But this is not the action desirable for the treatment of wounds where the atomic activity is objectionable; the chemical activity is soon over, or the Condy's fluid has gone. Now, in the treatment of wounds, what is wanted is a powerful antiseptic which can be retained in the neighbourhood of the wound without losing its virtue, and shall be itself as little an irritant to the tissues as is possible. These various properties have so far been found best combined in carbolic acid. Other antiseptics, and especially mineral acids and haloid salts, have been tried, but have been given up; and when antiseptic surgery is mentioned, carbolic acid, in its many preparations and vehicles, is almost certainly inferred. The virtues of tar in preventing decomposition, and its application to festering wounds in cattle, is an old part of farriery. The extraction of a principle from it, and its application to human sufferers, is a comparatively new use. But this antiseptic is a chemical irritant of itself, and of no slight potency either. Thus it has failed most markedly in cases apparently the most favourable; in others, under the most unfavourable circumstances possible, a capital result has been attained. Speaking generally, it may be made a matter of question whether secondary amputations have been so much benefited by it as primary ones certainly have. And this, too, depends rather on the condition of the patient than any possible variation in the surrounding atmosphere. The waste-laden blood in a primary amputation needs an antiseptic more than the comparatively purer blood of the invalid being prepared for operation. The chemical agent, too, is less an irritant when there is putrefying or oxidizing material to unite with it. Thus the more effete material or oxidizing matter in contact with the antiseptic, the more completely is the antiseptic neutralized; the less the oxidizing matter, the more free antiseptic is left to act as a chemical tissue-irritant itself. This is a view of the question which cannot be overlooked in looking at the failures. Thus, my esteemed friend, Mr Samuel Hey, thought he would give carbolic acid a fair trial, and honestly put it under apparently the most favourable circumstances; so he chose a secondary Syme's operation, and did all with the greatest care. The case did very badly; it obstinately declined to make any reparative effort; it remained wet and sloppy; the flap slipped off the bone, and the antiseptic treatment was given up, and the limb strapped up non-antiseptically, and did then very nicely. Now, it strikes me that it is more than possible that Mr Hey's extreme desire to try a nice case with it in order to give it as fair a trial as possible, just defeated the very end that he had in view. A case of that kind was just the very one to do well without antiseptics, and was therefore the very last case for it. The absence of oxidizing agents left the antiseptic free to act as a tissue-irritant itself. The extraordinary cases of smashes which have recovered without a bad symptom, after being treated antiseptically, can be fairly set against cases like the above narrated one, in more senses than one. The positive evidence of the efficiency in these cases tells us most unmistakably that there is something in the failure of the other cases which has not yet come out. What we do most seriously want to know is, how to discriminate betwixt the cases where antiseptics will avail us, and the cases which will do well without, and, *ergo*, not so well with, antiseptics.

It is admitted even by Mr Jessop, who has tried antiseptic surgery as honestly as any one, that rectangular-flap amputations are not much benefited by antiseptics: in fact, the disturbing the limb to dress it counterbalances the advantages quite, if not something more. In these cases, the opening is made so as to be dependent, consequently the effused fluids have a tendency to fall away by their own gravity from the tissues, and thus old putrefying fluid was avoided, and with it the sepsis-communicating tendency which, affecting the fluids nearest the tissues, set up suppuration. This principle of dependent openings was recognised by Teale empirically before antiseptic surgery had demonstrated one great cause at least why this modification should have been so successful in practice.

We find, then, that the advantages which practically arise from the use of antiseptics may be divisible into two headings:—

1. Cases where the presence of an antiseptic uniting with the effete products of the blood exposed to oxygen prevents suppuration.
2. Cases where the advantage may fairly be attributed to the destruction of septic material air-borne to the wound.

Practically these two must be so mixed up as to be in many cases inseparable.

We will consider first the cases which may be referred to heading 1. Thus we find severe destruction of tissue, which can only be removed by a process of sloughing of the partly-killed tissue, with a large effusion of fluids brought into immediate contact with the air, and which ordinarily would suppurate, and that, too, most freely. Now, here there can be no need to suppose, or rather presuppose, the existence of germs, for in the purest atmosphere, without antiseptics, nearly every case would suppurate freely at the least. And yet nothing is more common in the history of antiseptics than for this kind of case to do very well, and often to heal by first intention. But the careful exclusion of air at all leaves the question completely undecided, whether this is due to the exclusion of what the air bore with it, or to the exclusion of air as air containing oxygen. Now the experiments of Lister proved abundantly that a solution of organic matter, boiled and exposed to pure air alone, would not putrefy; but what they do not prove is, that a solution containing normally substances uniting with oxygen would not putrefy in pure air from the ready contact thus afforded for oxidation, and that that condition of chemical activity could not be communicated in the manner that Liebig has described. This is a question which it would be difficult to see even how to settle by experiment, or even what experiment would settle it. What is the effect of maintaining stumps in an atmosphere of pure air? Maisonneuve has told us the effect of keeping them in a vacuum. It was an improvement on the French method of treating wounds, but was very difficult of application, so as to maintain a vacuum efficiently. But the converse experiment would be more crucial. It is evident that if Maisonneuve excluded air, he must necessarily have excluded what the air bore with it. The question of how far the advantages of antiseptic surgery are really referable to the prevention of increased oxidation in the exposed fluids and tissues, due to their immediate exposure to the oxygen of the atmosphere, and how far to the extrusion of foreign agents exciting putrefactive changes, is to me at least unsettled—very unsettled. Cases there have been of bruises without solution of continuity of integument where all has passed into one abscess of putrefying pus. When could any germs or other septic agent have found their way in here? The lowered vitality of the bruised parts was unequal to holding the atomic combinations together in the presence of the oxygen of the effused blood. These cases throw some light on the other questions. For, as to life, considered chemically, it is that innate power in organisms to resist oxidation—except as regards waste. Plants that know not waste, and are entirely constructive, know no oxidizing process, in life at least. But animal life owes its energies to the destruction of its elaborate tissue. Every movement entails molecular destruction. The chemical action thus liberated is converted into the acting force required. Animal organisms have thus only oxidation before their tissues; it is a mere question of time and amount. Lacerated wounds and smashes suppurate as freely in the purest air of heaven as in the most ill-ventilated hospitals, unless protected by human art. Still, wounds, as a rule, do much worse in palatial hospitals than in pure country air, as the late Sir James Simpson showed. Granting all that can be said in favour of the cases under heading 1, we must admit the action of external agents in the second division.

2. Cases where the advantages may fairly be attributed to the destruction of septic material air-borne to the wound.

This heading comprises the ordinary amputations of an hospital, and especially the secondary amputations. Thus, in cases of excision of mammary gland, excision of joints, etc., primary adhesion and union have frequently been secured in the most unfavourable hospitals. We know, too, that this is due to the exclusion of extrinsic agents at the time of operation, as well as to the securing of the fluids from too free oxidation. Cases have occurred too frequently where a palpable defeat in the antiseptic protector has altered the result entirely.

Suppuration once excited in some systems is very uncontrollable, and no application of antiseptics afterwards will materially modify the cell-proliferation induced. This is due, unquestionably, to a weakness and irritability of the tissues of the organism. Incapable, after injury, of direct repair by primary adhesion, repair by the more slowly-moving process of rapid manufacture of incomplete cells seems the only process of which they are capable, whether antiseptics, as arresting the formation of tissue-irritants, are used or not. But on this subject it is well to be guarded; little is known, and any strong assertion would be hazardous.

But in the wards of an hospital, with minute particles of matter floating in the air, the advantage of antiseptic dressing is soon seen; slight unprotected contact may excite a process of atomic activity, which after care may be unequal to arrest. An obstinate process of putrefaction and suppuration may be induced by a short exposure. The condition of the air in hospitals was made a strong point by Sir James Simpson in his argument against palatial hospitals. The great tendency for wounds then to go wrong, and for the patient to die of after-consequences, he showed, more than counterbalanced the obvious advantages of skilled operators and scientific appliances. His arguments on the spread of surgical fever and pyæmia from one ward to another go far to settle the question that the *materies morbi* to be excluded by antiseptics are germs of foreign organisms and septic particles floated from one human organism to another. We want more proof of the capacity of lowly forms of life in an embryonic condition to excite active chemical changes. Antiseptics destroy them; true, because their vitality is too low to protect them from powerful chemical agents; the antiseptic forms combinations chemically with their constituents, which they are unable to arrest, as more highly vitalized organisms can and do.

On this point, too, we want evidence as to whether the septic material may not find its way to the wound by other means than contact. Mr Horsfall tells me of three cases which occurred when he was house-surgeon to St Bartholomew's, which tend somewhat to throw doubt on the fact that mere contact is the one and only thing to guard against. The three cases were reported by Holmes Coote, and were these:—Three amputations were performed simultaneously, and put in a row next to a case of extravasation of urine. The nearest went pyæmic, and had hospital gangrene at once, and died. The middle one's stump looked suspicious. The furthest one was apparently unaffected. They were removed into another ward. The middle one got much worse, but recovered; the one furthest away showed hospital gangrene, but it never amounted to much. Now, though contact through the dressings was theoretically possible, still there is room for grave suspicion that the view of the absorption of septic material by the lungs, and its manifesting itself at the wound, was not ill-founded. It is quite consonant with our experience, that a poison taken in by the respired air should manifest itself in the weakest spot of the organism, and notably at any new injury, whether of surgeon's act or not. The weakest points always go soonest, and the new tissue of a cicatrix melts away in hospital gangrene quite differently to the more vitalized old tissues beyond. The effect of a chemical agent on the new tissue is apparent at once, and demonstrates how readily imperfect tissue yields to chemical agency. The pus of wounds when healthy, the laudable pus of our forefathers, is readily changed by any chemical agent which produces decomposition of its molecules, and the evolution of chemical tissue-irritants provoking suppuration in their turn.

But still the question of whether the advantages of antiseptic surgery lie in the prevention of rapid oxidation—*i.e.*, putrefaction of the fluids, etc., exposed to air—or in the destruction of foreign agents exciting atomic activity in the previously quiescent fluids, must be regarded as decidedly *sub judice*.

Behind the question of the introduction of septic particles lies another very important question, which the future of science may perhaps some day be able to answer, viz., Are there different conditions of activity in the history of these septic particles? And again, Have different septic particles a different amount of atomic activity, and the power of communicating it? There seems every probability in favour of an affirmative answer to this question at no far distant period. The ordinary dust of rooms does not seem to be very potent for mischief; but we know that, in a pyæmic ward, or one infected with hospital gangrene, there are particles of fearful activity, if judged by their results. So, too, in hospitals, merely as such, without the presence of either of these scourges, the air is tainted, as the nose can judge; and wounds, speaking generally, have at least a tendency to suppurate. As the history of hospital gangrene well illustrates, nothing will so soon excite a particular molecular change as a particle in atomic activity from another organism undergoing that change itself. The poison of smallpox, of scarlatina, or of other infectious diseases, possesses not only the power of communicating its own atomic activity, as atomic activity, and producing increased tissue-change and heightened temperature, but of absolutely determining it in the direction of the reproduction of particles identical with itself, and capable of exciting a similar series of changes in its turn. Thus, smallpox does not become scarlatina, nor scarlatina become smallpox. Whether ordinary septic particles from suppurating wounds have ebbs and flows of activity in the various forms which must be assumed by an organic particle on its road to decomposition according to the amount of oxidation; or a regular process goes from circumference to centre,—is a question on which we can as yet merely speculate. It is very obvious, however, that an atmosphere laden with particles wafted from other organisms must of necessity require antiseptic surgery rather than the air of country districts. But if such antiseptic surgery will give us all the advantages of palatial hospitals situated in large centres both of population and surgical talent, and relieve us from the drawbacks hitherto inseparable from this aggregation—and where it has been thoroughly tried it has succeeded wonderfully, considering how recent is our knowledge on the subject (and what promise lies in the future with a better knowledge!)—it is a discovery the value of which it is difficult to estimate.

A number of opponents, even to making trial of the system, point out cases of unquestionable failure; but they beg the question in stating that the failure lies necessarily in the principle. If these failures were investigated thoroughly, the great majority at least would be found to originate in just the same manner as failures occur now and then in the hands of the most expert converts, namely, to oversight or want of care in the dressing. And even if some of them are apparently inexplicable on any other ground than inefficiency in the agent used, the objectors must remember that there lies before them a history of unquestionable success, which they, in their turn, can be asked to explain satisfactorily. We are not already, and at this early stage of the inquiry, entitled to assume that we have reached the ultimate knowledge possible in antiseptic surgery, we know we have much yet to learn; and if we are to judge what we do not know by what we do know—and there is no other rule—it seems probable that, with an increasing knowledge, we may be able to ensure increasing success; as a decided success has already followed our imperfect knowledge.

What cases are best suited to antiseptic treatment? What cases may be trusted to do without it? What cases will do best with very little antiseptic, *i.e.*, highly diluted, solutions? What cases will need strong solutions?—are all questions with which both the advocates and the objectors must grapple before anything really scientific, and thus intrinsically conveying success, can be attained. So far, the most startling cases, as compared to ante-antiseptic surgery, are the lacerated wounds and compound fractures where large portions of tissues and quantities of fluids are suddenly exposed to the atmosphere. The cases least benefited are the secondary operations, where the air of the ward merely was to be guarded against by dressings.

Whether there is a condition of tissue-irritability, which is incapable of repair by any other mode than suppuration and granulations, whatever treatment be adopted or not, cannot be answered.

The preparation of a patient for operation, the modification of "training," which was thought of so much more importance by our forefathers than by their surgical successors of this day, bears, too, directly on the question of antiseptics. When this is carried out, and thus the system put into the most favourable condition which it, as a system, is capable of assuming, the necessity is much lessened and reduced for resort to antiseptic treatment in its entirety at least. The sudden accident coming on the system unprepared, and in a sense unpurified, will always contrast the antiseptic treatment most favourably with other methods; and large segregational hospitals furnish the best comparative results with it.

Finally, there is as much evidence in favour of the value of antiseptic surgery in arresting the putrefaction of the fluids and tissues of the body suddenly exposed to the air, with their vitality lowered by the injury which exposed them, as in favour of its value depending on its action over extrinsic causes of putrefaction from without. That, in the large majority of cases, these actions are combined and inseparable, may be accepted as proved.

But, in taking leave of this interesting subject, I must ask the forgiveness both of the Editor and the readers (if any ever get so far) for being so much more diffuse than originally intended. The subject is one in which every thinker must be deeply interested; and the experiments conducted by Mr Jessop in Leeds were watched with an almost hostile criticism, so as to be fairly tested. These experiments Mr Jessop kindly allowed the writer full opportunity of examining; and, in addition, a second personal visit to Edinburgh, when Professor Lister's absence was well supposited by Dr Joseph Bell, have perhaps led the writer to regard the subject with a partial interest; and yet the absence of personal interest in the results better qualifies him as a dispassionate observer.

The conclusions arrived at were these:—

1. The success in the majority of cases is most unquestionable; when fairly and thoroughly tested.
2. The failures are in some cases referable to known causes; in some cases not so referable.
3. Will further investigation elucidate these unaccountable causes?
4. What cases are best suited to antiseptic treatment?
5. What cases are not so specially adapted?
6. Is the efficacy due to intrinsic action, or arrest of putrefaction in the body itself?
7. Or is it due solely or mainly to extrusion of extrinsic causes?
8. Are there cases of tissue-irritability which would suppurate under any circumstances?
9. In what cases is the antiseptic rather an irritant itself?
10. When are weak and when are strong solutions best suited?
11. Are the extrinsic causes germs (embryonic forms) or septic particles?
12. Is this power to excite and communicate their atomic activity variable during their history, or in their nature and essence? And if more is known of this atomic activity, is it likely that means will be found by which antiseptics will more thoroughly arrest it?

ARTICLE III.—*Criminal Lunacy in Scotland for Quarter of a Century, viz., from* 1846 *to* 1870, *both inclusive.* By J. BRUCE THOMSON, L.R.C.S. Edin.; Resident Surgeon, General Prison for Scotland, at Perth.

QUARTER of a century's experience of criminal lunacy in Scotland is now before us, and ought to afford some valuable statistics and practical lessons on a subject of paramount interest. The number, nature, and treatment of this class of prisoners, or rather prisoner-patients, called criminal lunatics, involve questions most grave and puzzling to psychologists, medical jurists, and the legislature. "Justitia præcipit parcere omnibus, consulere generi hominum."—*Cicero de Republ.*

The history of the lunatic department of the General Prison of Scotland, established in 1846, amply proves the necessity for such an hospital or asylum for insane criminals, and testifies to the intelligent foresight of the General Board of Directors of Prisons who inaugurated it. A very slight consideration will satisfy any one that there are various classes of insane criminals unfit to be placed in ordinary asylums, and can only be disposed of safely and satisfactorily by the State. There is a homicidal class, a salient feature of whose insanity is its *transitory* character. The impulse to homicide seizes the patient suddenly, and as suddenly passes away. Of this class several have been confined for life in the lunatic department of the

General Prison. One patient killed three persons in one night, and for years he remains quite sane; but repeatedly has said, "Get strong men to watch me or I must kill some of them." Another committed a double murder. Where can you place those belonging to this category, in order to safe custody, but in a prison asylum?

There is another class of much significance, and by no means few in number—dipsomaniacs who have committed murder. These are regarded as insane drinkers, urged by an irresistible propensity to this indulgence. They recover complete sanity, almost momentarily, after the violent act of murder. One has been confined for thirteen years, another for ten, and another for six years, without exhibiting any aberration of mind. Although so long sane, are such dipsomaniacs fit, under any circumstances, to be at large? The present Lunacy Acts do not permit sane persons to be detained in common asylums; therefore for safety to the public they are committed in custody to a prison asylum, because they are only safe and sane under confinement.

There is a third class, who have destroyed their own children under an attack of puerperal mania. These unfortunates, like the two former classes, are confined during Her Majesty's pleasure; and the doctrine hitherto acted upon is, that these should not be liberated until they have passed the age of childbearing.

A fourth class belong to those who in an insane state have committed outrages upon society by gross indecency and obscenity. Such, of course, must be excluded from ordinary asylums for the insane, and could only be received into a prison.

In addition to these classes, it has been found necessary to make provision for certain criminals becoming insane while undergoing their sentences in the penal department of the General Prison, and also local prisons. And it is ascertained that the liability of the criminal classes to an excess of insanity is very great, and much beyond that of the free population of the country.

Accordingly, the necessity for setting apart a ward of the General Prison of Scotland for the safe custody and treatment of criminal lunatics, was pressed very strongly upon the attention of the Directors; and in the year 1846, by a public grant, there was instituted the lunatic department. All the lunatics till then in prisons and asylums were collected and transferred to this department, in terms of Acts 2 and 3 Vict. c. 42, and 7 and 8 Vict. c. 34.

Here let us show,—*Who are held to be our criminal lunatics.*

In Scotland this term is applied to three classes of offenders, viz.:—

1. Prisoners found insane in bar of trial.
2. Prisoners tried and found insane at date of offence.
3. Prisoners who have become insane while undergoing their sentences in prisons.

Referring to classes 1 and 2, the term *criminal* lunatic seems a misnomer. Class 1 had no trial, and there is no proof of responsibility for the offence charged. Class 2, because of the plea of insanity at the date of offence having been accepted, is also held irresponsible; so that these two classes cannot properly be called, but for want of a better name, *criminal* lunatics. Class 3, having been tried and convicted of a criminal charge, may be properly enough called criminal lunatics or lunatic criminals.

The term *state lunatics* may be suggested as a fit and proper term for the 1st and 2d classes; inasmuch as, having committed grave and heinous crimes dangerous to the public, they are placed at Her Majesty's disposal, under the care of the State.

Table of Admissions to the Lunatic Department of the General Prison for Scotland, during 25 *years, viz.*, 1846–1870, *both years included.*

Years.	Criminal Lunatics.		Totals.
	Males.	Females.	
1846	7	3	10
1847	13	5	18
1848	9	2	11
1849	9	2	11
1850	8	2	10
1851	8	3	11
1852	6	4	10
1853	2	1	3
1854	3	0	3
1855	5	1	6
1856	2	3	5
1857	4	5	9
1858	7	3	10
1859	7	7	14
1860	5	3	8
1861	1	4	5
1862	5	0	5
1863	2	2	4
1864	7	1	8
1865	11	4	15
1866	8	0	8
1867	5	6	11
1868	7	4	11
1869	4	3	7
1870	4	5	9
	149	73	222

The foregoing table shows a gradual increase in the number of admissions; perhaps only *au courant* with the increase of the population of Scotland. My last annual report, just published, gives the particulars of all confined in this department during 1870, viz., 38 males and 20 females—total 58. In the same report is set forth a table of admissions during the last decennial period, giving the numbers sent from the General Prison and from other prisons or asylums:—

From the General Prison, - -	58
From other Prisons or Asylums, - -	35
Total,	93

The latter class comprehends chiefly all placed at Her Majesty's disposal—found insane in bar of trial or at the time of committing the offence, generally murder or offences of a violent, dangerous, or indecent nature.

But the table of admissions is chiefly remarkable for the small number of females compared with males; and this is a uniform feature of the history of criminal lunacy in Scotland. The males number 149, being double the number of females—73. Here is a problem for psychologists. Why is it that criminal lunatics show such a wide disproportion of the sexes? In England it is not so. In Bethlehem Hospital, during thirty-eight years, I find there was a preponderance of females, viz. :—Males, 3511; females, 5407.

The reports of the Lunacy Commissioners for Scotland give a greater proportion of females than males becoming insane; and the number of male and female criminals not insane does not differ very much, although the males do rather preponderate.

It may be suggested that murders and violent crimes, such as have been charged against criminal lunatics, are by no means so likely to be committed by the weaker as by the stronger sex; and the following table supports this view. Out of 74 criminal lunatics who have committed murder or attempted to do so by violence, I find a very small proportion are females. Thus:—

Committed murder, males, ...	32
Do. females, ...	14
Attempted to commit murder, males, . .	26
Do. do. females, . .	2
Total males who committed or attempted murder,	58
Do. females do. do. .	16

In the famous *Philosophical Dictionary* this suggestion is confirmed:—"Leading a more sedentary life, women possess more gentleness of character than men, and are addicted much less to the commission of enormous crimes,—a fact so undeniable, that in all civilized countries there are always fifty men at least executed for one woman." Why, in England, the females should be greater in the Bethlehem Asylum for criminals, is explained by the fact, that persons who have committed petty crimes are included among the criminal lunatics, which was notably the case till lately at Broadmoor.

Table of Ages of 222 Criminal Lunatics.

Years.	Males.	Females.	Total.
10 and under,	29	10	39
20 „ 30,	55	30	85
30 „ 40,	34	22	56
40 „ 50,	20	8	28
50 „ 60,	9	3	12
60 „ 70,	2	0	2
	149	73	222

The foregoing table shows the maximum liability to criminal insanity in both sexes to be from twenty to thirty years of age, which agrees with 5122 cases examined into by Dr Thudicum. The Hanwell statistics make the critical periods from thirty to forty. The experience of Esquirol led him to conclude that insanity in general increased progressively after mature age. I may observe that the above ages of the criminal lunatics are the ages of committal; but it is impossible to say how nearly the figures indicate the first onset of the malady.

The offences charged against these 222 criminal lunatics were as follow:—

Theft,	102
Murder,	46
Assaults, etc.,	28
Robbery,	8
Stabbing, etc.,	7
Assault with intent to ravish,	8
Wilful fire-raising,	3
Bigamy,	3
Breach of trust,	3
Concealment of pregnancy,	2
Malicious mischief,	2
Forgery,	2
Falsehood, fraud, etc.,	2
Uttering base coin,	1
Rape,	1
Horse-stealing,	2
Felony,	1
Libidinous practices, etc.,	1

The cases of murder, violence, and indecency, have been almost all persons found insane in bar of trial or at time of offence. The cases of theft, etc., are chiefly criminals who became insane while in prisons undergoing their sentences.

The forms of insanity, so far as known, were:—

Mania, chronic,	85
„ homicidal,	37
„ acute,	15
„ epileptic,	7
„ puerperal,	6
„ melancholia,	2
„ hysterical,	1
Dementia,	49
Imbecility,	7
Idiocy,	4
Feigned (?),	8

The counties to which criminal lunatics belonged were :—

Aberdeen,	10	Kinross,	0
Argyll,	13	Kirkcudbright,	1
Ayr,	8	Lanark,	55
Banff,	1	Linlithgow,	2
Berwick,	0	Nairn,	0
Bute,	0	Orkney,	0
Caithness,	2	Peebles,	0
Clackmannan,	1	Perth,	12
Dumbarton,	1	Renfrew,	7
Dumfries,	2	Ross and Cromarty,	1
Edinburgh,	36	Roxburgh,	6
Elgin,	0	Selkirk,	1
Fife,	11	Stirling,	18
Forfar,	17	Sutherland,	1
Haddington,	0	Wigtown,	3
Inverness,	7	Zetland,	4
Kincardine,	1		

The following are the occupations of 100 criminal lunatics :—

Males.—9 labourers, 5 miners, 4 masons, 3 carters, 3 fishermen, 3 seamen, 2 mill-workers, 2 tramps, 2 joiners, 2 shoemakers, 2 weavers, 2 painters, 2 bakers, 1 domestic servant, 1 gardener, 1 shepherd, 1 hawker, 1 draughtsman, 1 coachman, 1 flesher, 1 tinker, 1 chimney-sweeper, 1 photographer, 1 watchman, 1 wood merchant, 1 fishing-tackle maker, 1 blacksmith, 1 butler, 1 bellhanger, 1 shipbroker, 1 inspector of poor, 1 surgeon, 1 polisher, 1 potter, 1 dyer.

Females.—7 domestic servants, 6 mill-workers, 6 housewives, 6 housekeepers, 5 tramps, 2 seamstresses, 2 hawkers, 1 weaver, 1 shopwoman, 1 prostitute.

Of these same 100 we are enabled to give further particulars :—

Married or Single :—

Married,	16 males,	15 females,	31
Single,	47 „	22 „	69
			100

Complexion.—20 fair, 40 fresh, 14 sallow, 11 dark, 10 pale, 5 swarthy.

Colour of Hair.—24 black, 26 brown, 18 dark, 15 gray, 4 red, 3 auburn, 10 fair.

Colour of Eyes.—40 gray, 32 blue, 14 hazel, 8 brown, 6 black.

Education.—18 cannot read; 42 can read a little; 36 can read well; 31 cannot write; 48 can write a little; 17 can write well; 4 of superior education, and can read and write well.

Religion :—

40 belong to Church of Scotland.
25 „ Roman Catholic Church.
17 „ Free Church.
7 „ United Presbyterian Church.
5 „ Episcopal Church of England.

2 belong to Evangelical Union.
2 „ no religion.
1 „ Greek Church.
1 „ Methodist Church.

These statistics have carried us beyond the limits of our intended article, and we offer further only one or two conclusions from experience of the value and necessity of this lunatic department of the General Prison for Scotland:—

1*st*, Experience shows that such an institution for criminal lunatics has been of great public service, and cannot be dispensed with. A prison asylum is a place of secure custody for dangerous lunatics. At the very time the Board of Directors were making arrangements for such an institution, an insane criminal made his escape from Paisley Asylum; and it is quite clear that the freedom given to patients in ordinary asylums is opposed to the security necessary to be exercised in regard to dangerous criminals. Further, applications have, time after time, been made for the admission of convicts whose insanity is such that they might as well go to any asylum as this prison asylum; and such applications have been uniformly refused, on the ground that the criminal insane should not be associated with the ordinary insane. If common criminals are thus refused, *a fortiori*, violent and dangerous criminals would be refused.

The following case may be given in illustration:—

W. C. secreted a lethal weapon, and suddenly attacked and murdered an inmate of a lunatic asylum. The feeling of horror awakened in the minds of friends of patients was such that the tragedy threatened to injure the asylum, and the criminal lunatic was about to be thrown out upon the charge of his relatives. What could have been done in this case had there not been a refuge for this criminal lunatic in the General Prison? After some delay, he was brought to trial, and on a verdict, "Insane at the time of offence," before the High Court of Justiciary, he was ordered "to be placed in strict custody during Her Majesty's pleasure."

Besides, there are a class of homicidal men and women—such as dipsomaniacs and puerperal maniacs—who become sane, and continue so, but who are not regarded as safe to be at large. The law does not allow *sane* persons to remain in lunatic asylums; and the following case shows that a prison or state asylum is the only fit and proper place for such patients:—

J. W. stabbed a man fatally in the streets under a fit of dipsomania. Instead of being committed to the lunatic department of the General Prison, this criminal lunatic was allowed to be sent to a first-class lunatic asylum. As in cases of dipsomania, the homicide recovered his intellects almost immediately after the heinous act, and after a short time was liberated from the asylum. Not long after his liberation this person was again confined for an act of violence, and I believe is so now. This was almost the only instance in which the Directors of Prisons allowed one who was charged with murder to be sent to a common asylum.

2dly, During the experience of criminal lunacy in Scotland, it is proper to mention, increased care and attention have been given to all criminal lunatics; and the prison asylum has kept pace with the more humane and more intelligent treatment of this most unfortunate of all classes of the insane. At the same time, it must be satisfactory to the public as well as the profession to know, that the economy of the lunatic department for criminals so advantageously compares with the expenditure of the great "Broadmoor State Asylum" in England. In the 32d Report of Prisons in Scotland just published, the cost per head per annum of criminal lunatics in England and Scotland is set forth as follows:—

Broadmoor, 1869, ...	£64, 8s.
Estimated for Scotland, . . .	£25.

Comparing the system of treating the criminal insane in Scotland with that adopted in England and Ireland, we cannot but prefer our own views of who are to be considered our criminal lunatics. When we visited the great asylum for criminals at Broadmoor in 1864, we found there a number of patients whose crimes were not of a dangerous nature in a state of dementia or imbecility, such as in Scotland would not have been admitted to the lunatic department of the General Prison, but sent, after expiry of sentence, to a common asylum, or the lunatic ward of a parish poorhouse. Yet here were numbers under a Royal or Secretary of State's warrant likely to be detained for life. We believe a selection has since been made from these, so that only the violent and dangerous, as in Scotland, are held fit subjects for detention in the State Asylum at Broadmoor.

In Ireland, in that same year, when I revisited Dundrum, the whole of the criminal lunatics were not collected there, but many of them scattered over the country in ordinary lunatic asylums and in prisons, where they could be but ill-cared for.

Compared, then, with England and Ireland, we consider that Scotland has been for many years better circumstanced; our criminal lunatics being only violent and dangerous persons, or such as have committed murder, or outraged public order and decency; while the lunatic department of the General Prison has all the comforts of an asylum, and insures the safe custody of those criminal lunatics who are unfit to be set at large.

In the 32d Report on Prisons in Scotland, already referred to, we have reference made to a new proposed legislation for certain classes of criminal lunatics confined in the lunatic department of the General Prison for Scotland. We give the words of the Report:—

"We may hope for some relief,[1] should a bill now in the hands of the Lord Advocate be passed during the present session. Among other provisions to remedy defects in the law relating to criminal and dangerous lunatics, it contains a clause for the conditional removal of inmates of the lunatic department in the General Prison. This clause would afford opportunity for putting such persons into the charge of relations or other persons prepared to look after them, but under certain precautionary conditions relating to supervision or otherwise, and with the final condition of liability to removal back to the lunatic department in the General Prison, if that should be found necessary."

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[1] The lunatic department being now crowded.

ARTICLE IV.—*On a Case of Trance.* By W. ALLAN JAMIESON, M.B., Berwick-on-Tweed.

THE exact nosological position of the following case is doubtful. It differs from true catalepsy inasmuch as there was an absence of plasticity in the limbs: thus the arms, though usually folded across the chest with the flexor muscles in a state of slight tonic contraction, on being removed from that situation and raised up, dropped when no longer supported unresistingly by her side; while the complexion was more highly tinted than in the waking state. It much more closely resembled somnambulism, the sleep being more profound than natural, though the imagination did not prompt to the performance of co-ordinate motor acts. That it was not feigned I am convinced, though some might call it a mere phase of hysteria, hysteric coma. From its indefiniteness I prefer the word trance, here used as expressing a morbid mental state lying on the borderland between somnambulism and catalepsy, in a person of hysterical constitution.

Catherine K., æt. 16, domestic servant, a well-grown pretty girl, with dark hair, full lips, and brown eyes, shaded by drooping lids, of active lively disposition, though wayward temper. Her appetite had been capricious of late, but otherwise she was in good health up to the evening of the 25th February 1871.

While in the passage leading up to her master's house shortly after six, she was struck a violent blow on the right cheek by a lad whom she had spoken sharply to for some rude conduct. Though the blow was painful and stunned her, it produced no other immediate effect, for she went down the street, delivered a message, and on her return did some household work. Shortly before seven she was found lying unconscious on the stair. She was removed to a sofa, cold water was dashed freely over her face, burnt feathers were applied to her nostrils, and sinapisms to her legs. These measures failing to rouse her, I was called in.

I found her lying as if asleep, breathing quietly, with a pulse of 90, regular, and of good strength. The right cheek, over the malar bone, and round the eye, was a little swollen; and on touching this she shrank as if it were painful. There was slight but constant quivering of both eyelids, which were closed; on opening them the conjunctiva was insensible to touch. The pupil was moderately dilated and reacted to light. By-and-by there were slight symmetrical clonic spasms of the legs and arms, which ceased when the mustard poultices were removed. No signs of consciousness being elicited by rough shaking or shouting, a pinch of snuff was gently blown up each nostril, but without causing any reflex action. I then threatened to bleed her, and after much preparation bared her arm, and drew a cold piece of iron across it, but there was not a trace of resistance. In deference to the wish of her relatives, a couple of leeches were put on the bruised part. The catamenia were said to be regular, though recurring every three weeks; and it was nearly that time since their last appearance. She had a similar attack after a fright two years ago, lasting three hours and a half, from which she awoke crying.

26th.—She awoke about 2 A.M., and again between 6 and 7, sat up for a short time while she arranged her dress and ate some biscuits, appearing quite rational, though complaining of pain in her limbs and heaviness in her head. The urinary secretion is normal, only containing a slight leucorrhœal deposit; it is passed during the waking intervals.

At half-past nine in the morning she was again in the state of trance, the pulse 90, temp. 98·6°. There was a peculiarity about her respiration: though always quiet, it presented a rhythmical arrangement; the inspirations gradually became fainter and fainter, till the cycle was closed about every five minutes by a deep sigh. During my visit she once called out, "There he comes again, but never mind," in probable allusion to the lad who struck her. She did not again become conscious till 5 P.M., and then only for a short time. As the bowels had not acted since her seizure, a drop of croton-oil was this evening placed upon her tongue.

27th.—The medicine operated freely thrice, but the soporose condition continued without much change. During one of her rare waking intervals, she was led home, a distance of a hundred yards, and fell asleep on the way. In the evening, having propped her up in bed, I examined the fundus of the eye with the ophthalmoscope. Owing to an irregular distribution of the retinal vessels in the right eye, and to her wincing when the eyelid was touched, the observation was made on the left. The colour of the fundus became paler as the region of the optic disc was approached, though whether this merely arose from deficiency of the superficial layer of choroidal epithelium, or from actual anæmia of the vessels of the choroid in that part,[1] I was unable to determine. Certainly the choroidal vessels were very plainly visible even to their tolerably fine ramifications. There was, however, a marked contrast in size between the retinal veins and arteries. Compared with their appearance after the attack had quite passed away, the veins were larger and the arteries smaller, and at the time this was especially distinct, the veins standing boldly out against the white background afforded by the disc and orange-coloured choroid, while the arteries were fine and hairlike. There was no pulsation in either set of vessels.

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[1] Dr Hughlings-Jackson on the Retina in Sleep. See Carpenter's Physiology, 6th edit., p. 590.

I watched for long before the disc came fully into view, but at last the eye remained sufficiently steady, with the optic nerve in the centre of the pupil, to allow me to assure myself of the correctness of the observation.

28th.—At 10 A.M. was still in the state of trance, and had been so without waking since 5 P.M. yesterday. The skin of the right eyelid was to-day seen to be marked with reddish lines, and round the eye there was yellow subcutaneous staining. She awoke at eleven, soon again to relapse into unconsciousness; but at my evening visit she was sitting up in bed at length thoroughly roused. She declared she had never been asleep, said she remembered nothing since sitting down on the stair in her master's house on the evening of the 25th.

Though several times asleep after this, the slumber was never again so profound, and she was almost quite well on the 3d March, on which day the catamenia appeared, though scantily. For a day or two after she was otherwise well, the vision of the right eye was rather indistinct.

There are two points in this case (which in its duration reminds one of the classic legend of the nuptials of Alcmena and Jupiter) deserving a moment's consideration.

First, as to *causation*. Had the blow anything to do with the seizure? The case appears to me to be an example of one of the rarer forms of the remote consequences of nerve-lesion. Hufeland[1] relates a case of *running* and of *catalepsy* caused by a blow on the head. Attacks of hysteria often date their first appearance from a fall, or even from some injury so trivial apparently as to leave no visible trace. Again, there is a stage of incubation in hysteria and allied affections as truly pre-existent, though perhaps less evident, as in smallpox or measles. In many instances, this stage is marked by a degree of capriciousness as to diet, and this producing more or less defective nutrition favours the nervous instability, and uncommon reflex effects result in such persons from causes which in a healthy nervous system would be trifling.

Secondly, as to the *nature* of the attack. The blow was followed by reflex vaso-motor changes; the circulation through the brain was impeded by the contraction of the arterial and dilatation of the venous system; renewal of tissue-change in the central nervous system was at its minimum, and a deep stupor was the result. By degrees this wore off, but the imperfection of vision, and the feeling of weight in the head, remaining after the return of consciousness, would show that the vascular system was slow in recovering its natural tension.

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[1] Holmes's System of Surgery, 2d edit., vol. iv. p. 191.

ARTICLE V.—*Record of the Cases of Tumours of the Breast admitted into the Clinical Wards of the Edinburgh Royal Infirmary from* 1833 *to* 1869. Extracted from the Ward Journals by JOHN CHIENE, M.D., F.R.C.S.E.

IN a graduation thesis on "Diseases of the Breast," I was enabled, through the kindness of the late Mr Syme, to illustrate the section on tumours by tables of cases treated in the clinical wards. At that time the cases from 1850 to 1864 were tabulated; to these are now added the cases from 1833 to 1850, and from 1864 to 1869, when Mr Syme resigned the chair of Clinical Surgery. With a few exceptions, in which the journals are amissing, the whole period from 1833 to 1869 is thus completed. All doubtful cases have been omitted. I trust that some interest will be attached to the results of Mr Syme's treatment of this important class of cases during his long tenure of office as Professor of Clinical Surgery.

The tumours have been classified under the following heads:—1. Cystic; 2. Mammary Glandular, or Fibrous; 3. Scirrhous; 4. Encephaloid; 5. Epithelial.

		No. of Cases admitted.	No. of Operations performed.	Result of Operation.	
				Recovered.	Died.
Innocent Tumours,	Cystic, . .	28	26	26	...
	Mammary Glandular, or Fibrous,	29	29	29	...
Malignant Tumours,	Scirrhous, .	187	145	135	10
	Encephaloid,	2	2	2	...
	Epithelial, .	1	...	...	...
	Total, .	247	202	192	10

247 cases—245 females, and 2 males.[1] 202 operations, 10 deaths, nearly 5 per cent.; or, in other words, of every 20 persons operated on, 1 died. The fatal cases occurred after excision of the breast for primary scirrhus. The cause of death was shock in two cases, and in the remainder either erysipelas or inflammatory affections of the thoracic viscera.

1. *Cystic Tumours.*—This class includes simple serous cysts, compound cysts, and fibro-cystic tumours. 28 cases, 26 operations,

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[1] 1. W. D., æt. 50, admitted August 1850. Fibrous tumour. Removed with a successful result.

2. D. G., æt. 51, admitted June 1867. Scirrhous tumour of right breast. Tumour removed. Patient re-admitted in May 1868 with a similar tumour in right breast. An attack of insanity necessitated patient's removal to Morningside Asylum.

all successful. The simple cysts (11 cases) were punctured, followed by the application of a blister. Of the remaining 17 cases, in 15 the tumour alone was removed, in 2 the breast was excised along with the tumour. Average age on admission, 39 years; average duration of disease before admission, 4 years (shortest duration 2 weeks, longest 13 years); average age when the tumour was first observed by the patient, 35 years.

2. *Mammary Glandular or Fibrous Tumours.*—These tumours have received very various names: fibrous sarcoma (Cruveilhier and Syme); pancreatic sarcoma (Abernethy); chronic mammary (Astley Cooper); and mammary glandular (Paget). 29 cases, 29 operations, all successful. 28 females, 1 male. Average age on admission, 30 years; average duration of disease before admission, 2 years; average age when the tumour was first noticed by the patient, 28 years; average stay in hospital after operation, 18 days. In the majority the tumour alone was removed, in the remainder the breast was excised along with the tumour.

3. *Malignant Tumours.*—190 cases; 187 *scirrhous*, 2 *encephaloid*, and 1 *epithelial* cancer. The case of epithelial cancer was too far advanced to admit of operation. E. W., æt. 55, admitted 16th December 1863. The disease commenced in 1854 as a small ulcer. The whole mamma and the lymphatic glands in the axilla are now involved. In both cases of encephaloid the tumour was removed. 1. J. H., æt. 45, admitted 8th December 1859. Duration of disease, 8 weeks. Tumour the size of a closed fist. Tumour removed. Dismissed cured 1st February. This patient was re-admitted in March of the same year. The axilla is now full of enlarged glands. Dismissed *in statu quo.* 2. M. G., æt. 54, admitted 31st January 1866. Duration of disease, 5 months. Tumour the size of a child's head. Tumour removed. Dismissed cured 9th March. *Scirrhous Cancer.*—Total number, 187, of which 178 were primary, 9 secondary. Of the primary cases, 137 were operated on; in 132 the breast was excised, in 5 it was removed with caustic. In 1857, 2 cases occur in which an enlarged lymphatic gland was removed with the knife before the application of the caustic; with these exceptions, no case in which the glands were affected was operated on. In 132 cases of excision, 10 deaths as a result of the operation occurred, or 7½ per cent. In 5 cases removed by caustic, 2 were cured, 1 relieved, and 2 dismissed *in statu quo.* A mixture of sulphuric acid and sawdust was employed in 4 cases, chloride of zinc paste in 1 case. The average age on admission was 49 years; the average duration of the disease before the patient applied for relief, 2 years; the average age when the disease was first noticed, 47 years; the average stay in hospital after operation, 27 days. I have noted which breast was affected in 64 cases; the left breast was diseased in 33, the right in 30, and both breasts in 1 case.

Table of 116 cases of primary scirrhus, showing the proportion of cases occurring in each decennial period :—

Under 25,	2 cases	1·7 per cent.
25 to 35,	10 „	8·6 „
35 to 45,	42 „	36·2 „
45 to 55,	36 „	31·1 „
55 to 65,	24 „	20·7 „
65 to 75,	2 „	1·7 „
Total, .	116	100

Secondary Scirrhus.—9 cases; the secondary disease was removed with the knife in 6, in 1 the disease was removed by caustic, in 2 an operation was deemed inexpedient. In one case the patient remained well after the primary operation for 36 months, in 1 for 24 months, in 1 for 18, in 1 for 12, in 2 for 4 months, in 1 for 3 months, and in 1 the disease returned before the wound of the primary operation was healed.

ARTICLE VI.—*Case of Paralysis and Sudden Death in the Pregnant State.* By DR R. PEEL RITCHIE, F.R.C.P.E.

(*Read before the Obstetrical Society of Edinburgh, 8th February.*)

I DESIRE to submit this case to the Society solely on the grounds that it is no common one, and that it has been the only one of the kind I have met with, complicating pregnancy.

I can claim no merit for my accuracy of diagnosis, nor for the success of my treatment. Placed in the circumstances I was when called to see the case, I do not think, on reviewing its course, I would, even now, have acted differently; and seeing the result was fatal, I have considered it proper to place it on record, to call the attention of Fellows of the Society to a formidable form of disease complicating the pregnant state. It is to be greatly regretted that the feelings of the friends would not permit a post-mortem examination. In the medical certificate of cause of death, I found it therefore necessary to state that the patient was pregnant, suffered from paralysis, that the death was sudden, and that no post-mortem examination was permitted. I did not expect that the Registrar would have been satisfied with a certificate so worded.

15*th December* 1870.—Mrs S., aged 25.—A message was left at my house last night at a late hour to call on this patient. As I did not receive the message till midnight, in consequence of being professionally engaged, I did not call till to-day. I found her complaining of severe pain in head—all over it, but chiefly on left side. So severe was the pain that she could not move the head without screaming out. I received the following history :—She had previously enjoyed good health, but stated she had always been very "nervous." Had been married for six years. She was now pregnant for the fourth time, and in previous pregnancies had enjoyed good health; her labours were easy, and her recoveries satisfactory. She was taken ill about three weeks ago with pain in left side of head, and also apparently with pain in left shoulder, and states she was treated for rheumatic fever and neuralgia; has been unable to sleep from pain in the head; for some time has passed daily, and still continues to pass, very little water. About two weeks ago, lost power to move left arm; the left leg soon after became affected, and recently the right arm became partially paralyzed, but the right leg has still retained its motor power; there has been anæsthesia of left arm and leg for some days, but for how long is uncertain; the joints have not been swollen. Has felt no fœtal movements for several days.

On examination, she is a stout, previously healthy-looking woman. She complains of breathlessness; cannot lie except on left side. She lies almost on the abdomen, and the uterine tumour is felt displaced in consequence. She cannot move herself. The respiratory sounds are normal; the voice is clear, and she makes frequent outcries of pain. Heart-sounds are also good, except perhaps a slight prolongation of first sound, but there is no bruit. The pulse beats at 80, and is regular and of fair strength. The appetite is tolerably good; she requires to be fed. The bowels are confined. No "globus" described. The tongue is coated, indented, and drawn to left side. She passes very little water at a time, and only with great difficulty. Her desire to do so is urgent, and she requires to be often got up, from her frequent ineffectual efforts to micturate. She is moved with difficulty, from her being so heavy, and unable to assist in moving herself. The urine is loaded with red urates (to be examined); it has been scanty for some time—not exceeding a pint a day. There is no swelling of the feet, but the face on right side looks somewhat swollen. The skin is not hot, and she perspires, but not to any excessive extent. Considers she has completed 6½ months of her fourth pregnancy. The os was high, and had an irregular ragged feeling; the point of finger can be introduced. Supposes some escape of the liquor amnii occurred within the last day or two. Has felt no fœtal movement for some days. On examination, no fœtal heart-sounds were heard, but from her position in bed examination was difficult.

She is quite unable to move herself; requires to be lifted into and out of bed. There is tenderness along the course of the spine. Has no feeling in left arm, but it is warm; she cannot move it. Can tell the toes of left foot when touched, and can move right leg. The feeling in and motor power of right arm are impaired. Has constant pain in head on left side. The left cheek looks flattened. The left eyelid is opened to less extent than right, but whether from ptosis or from pressure on it I am uncertain, though inclined to regard it as a state of ptosis. Pupils are equal and contractile. Right side of face full and flushed; there is an expression of suffering.

As she was taking a saline diuretic mixture several times daily and morphia at bedtime, I made no change in treatment until I examined the state of the urine.

16*th December.*—Passed very little urine yesterday, and I only got some late last night. On examination, find it is albuminous, but only to a slight extent, there being little more than a trace. She had a bad night, even with the morphia. Ordered pil. col. co. immediately, and 10 gr. bromide of potass every sixth hour.

Midnight.—Was called to her, as she was stated to have labour-pains. Found there was no action of the uterus going on, but she had frequent calls to micturate; she had passed no water for nearly twenty-four hours. At 2.30 A.M. introduced the catheter, and drew off about 10 oz. of high-coloured, but not ammoniacal, urine; she then said she felt much easier; has been sweating.

17*th* (Forenoon).—Passed a tolerable night after I left. The bowels acted freely; left arm no better; less sensibility in left leg; less motor power in right arm; can still move right leg. Catheter used—10 oz. of urine were drawn off.

18*th* (Forenoon).—Passed a good night, but no urine; less nervous power all over body; head less pained; no fœtal movement. From her position in bed, had difficulty in introducing catheter; about 10 oz. were drawn off.

Evening.—Heard fœtal heart sounds this evening. She takes the bromide every four hours, and a teaspoonful of sp. æth. nitrosi twice daily.

19*th* (Forenoon).—Voice not so loud (partial aphonia); can now lie more on back; there is ptosis of left lid. Is unable to move left leg, or right arm or leg, but has returning feeling in and can keep left arm flexed when resting on elbow; pupils contractile, apparently equally so, and of regular shape; fœtal heart heard distinctly. Urine urgently requested to be drawn off, which was done by nurse, but the quantity is not materially increased—she suffers less pain. Professor Simpson saw her with me to-day, and recommended ergot in small doses, in the view there may be congestion of the spine.

20*th.*—She passed a good night, had even more power in left arm, but the urine was very troublesome, and had been drawn off. She took a good breakfast, and was cheerful. The nurse left her for a short time before 11 A.M., and, on her return, observed a change. She looked dark in colour, and the face was drawn to right side; the breathing was also affected. She was unable to speak, but the power to articulate soon returned. She was then conscious, but soon after became unconscious, and died at 1 P.M., "as the gun fired." I was not sent for to my house, but looked for at the Infirmary, through some mistake on the part of the messenger. Whilst conscious, longed for my arrival, and said she was dying. On my calling in course of the day, found she had died an hour and a quarter before. She was cold; no fœtal sounds were audible. My first thought was to remove the fœtus by section; but, considering the stage of pregnancy, and the time she had been dead, I refrained from doing so. Her pupils were dilated; the teeth firmly clenched; frothy mucus, as if she had suffered from a convulsive attack, issued from the mouth; the lips were darkly discoloured, and I failed to force open the jaws. I stated a post-mortem examination would be necessary, but this was afterwards refused.

Remarks.—When I visited this case for the first time, I saw that it was one of neither a trivial character nor of frequent occurrence. I looked for an explanation of the phenomena of the disease first in the state of the urine, expecting to find it in a highly albuminous condition; but, on the contrary, although there was a trace of albumen in it when boiled, there was not sufficient to warrant me in concluding that the state of the kidney explained the nervous symptoms. Besides, too, this was not a first pregnancy, and I was warranted, by the opinion of observers, in concluding that if albumen were present, it was most likely due to a chronic condition of kidney disease, and consequently that the presence of albumen would have been shown in larger quantity. This source of the paralysis I therefore dismissed, as being insufficient to account for it.

2d, The next view that occurred was, Is this one of those cases described as reflex? But, on reviewing the whole circumstances of the case, I did not consider that this view would explain the constant neuralgic pain on left side of head, the apparent ptosis of left lid, and the progressive extension of the paralysis from left arm to left leg, to right arm, and subsequently to right leg.

3d, Another source of the paralysis which occurred to me was embolism; but careful auscultation convinced me there was no valvular lesion of the heart, and the progressive character, without sudden commencement of the paralytic attack, induced me to abandon this view.

4th, I must own I had some doubt at first whether the attack might not be hysterical. The statement of the patient that she had been previously "nervous," her outcry, and the retention of the urine, her healthy appearance, all favoured this; but I dismissed this view when I became more familiar with the case. The absence of the hysterical globus, the perfect anæsthesia, the ptosis, the scanty renal secretion, all induced me to regard the case as due to some cause more serious, however hysterical the manner of the patient might be.

5th, The only conclusion I could come to was, that the source of the paralysis was in the central nervous system, and that the paralysis was to be regarded as a complication, not a consequence, of the pregnant state.

The diagnosis I made was, that the patient, whatever other lesion there might be, was suffering from congestion of the meninges of the spine and base of the brain. Adopting this view, I placed her on the bromide of potass, at first to the extent of 40 grs. a day, and afterwards on 60 grs. As the diuretic mixture she was taking had produced but little effect, although powerful in its composition, I intermitted it; and as the bowels had been costive for several days, obtained a free action by meams of compound colocynth pill. As the nursing of the patient was very far from what it should be, I felt it my duty to recommend her to apply for admission to the Maternity Hospital as a private patient; but this was declined, and it was only two days before her death that she was placed under the care of a qualified nurse. This diagnosis does not, however, account for the sudden termination of the case within two hours.

6*th*, Since her death, when I review all the indications of her state, I am rather inclined to view her disease as having possibly been a local cerebritis ending in abscess, and that the congestive symptoms of the spine and base had been secondary to the local cerebral inflammation. Not having seen the patient in the earlier stages, I cannot state whether the premonitory gastric indications existed, or whether the sickness of cerebral disease might not have been supposed that of pregnancy; but when I first visited her, the confined state of the bowels was repeatedly spoken of by her, and the difficulty there had been to get them to act by means of medicine was alluded to. I certainly have seen one instance verified by an autopsy in which cerebral abscess existed and proved fatal, in which, till within six days of death, the symptoms of cerebral inflammation were not distinct, but in which a severe local cephalalgia existed on the left side, and corresponded with a circumscribed intracranial abscess.

The symptoms in Mrs S.'s case which seem to me to favour the view that she suffered from a local cerebritis, are—The headache being the first symptom, and, so far as I can understand, of sudden origin and local in position, becoming unilateral; the ptosis; the intellect being so little affected; the sensibility of the limbs being so markedly affected, whilst the temperature was not diminished; the progressive character of the paralysis; and, in the absence of any disease in the thoracic viscera, the sudden death, which seems to have been preceded by convulsion, followed by coma of a very limited duration, and might possibly have been produced by the rupture of a cerebral abscess. The absence of delirium, the regular state of the pupil, the returning power in left arm, and also there being no rigidity of any limb, may be urged against this supposition; but an ordinary apoplectic attack appears to me to be insufficient to explain the circumstances of her death.

Before concluding, one word may be expected regarding my non-interference on behalf of the fœtus. When I saw the patient was dead, my first thought was to open the abdomen; but reflecting, when I heard that she had been so for at least an hour and a quarter, that there was no probability of saving the child, and even if I had had the chance of operating immediately after death, that it was doubtful if the child would have been viable, I refrained from a procedure which I felt would have only been for the gratification of my own curiosity, and could have resulted in no benefit to the unborn child or the afflicted relatives.

ARTICLE VII.—*The Therapeutic Actions and Uses of Turpentine.*

By J. WARBURTON BEGBIE, M.D.; Fellow of the Royal College of Physicians, Edinburgh.

(*Read before the Medico-Chirurgical Society of Edinburgh, 7th June.*)

TURPENTINE, the τερέβινθος or τέρβινθος, and in the earlier form τέρμινθος, of the Greeks, has an ancient as well as interesting history. Already esteemed as a remedy in Hippocratic times, and mentioned in three of the treatises which bear the name of the Father of Medicine,[1] if indeed these were not composed by Hippocrates, there exists little ground for questioning the identity of the Pistachia Terebinthus,[2] a plant yielding, in common with certain of the Coniferæ, the liquid turpentine, with the Terebinthus of the ancient writers. By Theophrastus, Dioscorides, Galen, and Pliny, many original observations concerning the use of turpentine are also made, and these are copied by such subsequent writers as Aetius, Oribasius, Paulus Ægineta, and Alexander Trallianus. Hippocrates, at least the Hippocratic author, had ascertained the emmenagogue virtues of turpentine, and also its action in restraining discharges from mucous surfaces, particularly those of the genito-urinary passages,[3] and the writers subsequent to him, of whom Dioscorides[4] as a Greek, and

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[1] ΠΕΡΙ ΓΥΝΑΙΚΕΙΗΣ ΦΥΣΙΟΣ. ΠΕΡΙ ΓΥΝΑΙΚΕΙΩΝ, τὸ δεύτερον. ΠΕΡΙ ΣΥΡΙΓΓΩΝ.

[2] "Indeed, this last mentioned plant is probably the true Terebinthus of the ancients."—*Pereira*, The Elements of Materia Medica and Therapeutics, vol. ii. part i. p. 1183.

[3] After referring to passages in the Hippocratic writings regarding turpentine, *Trousseau* and *Pidoux* observe, "Si la première de ces citations est vague et caractérise peu l'action spéciale de la Terébenthine, ce que nous sommes loin de nier, puisque le père de la médecine n'a presque jamais parlé d'un remède excitant sans le déclarer emménagogue, la seconde établit clairement que ce grand observateur avait administré la Terébenthine dans les cas où elle est le mieux indiquée, les flux muqueux, et spécialement ceux des voies génito-urinaires."—*Traité de Thérapeutique et de Matière Médicale*, tome seconde, p. 582.

[4] ΠΕΔΑΚΙΟΥ ΔΙΟΣΚΟΡΙΔΟΥ. Περὶ ὕλης ἰατρικῆς, βιβλίον πρῶτον. Περὶ Τερμίνθου. In this passage the learned Anazarbian signalizes the possession by turpentine of diuretic and aphrodisiac properties, also its virtues in pulmonary catarrhs and phthisical disorders, in rheumatic affections, in palpebral inflammations, attended by loss of the eyelashes, in scabies, and certain chronic cutaneous eruptions. Moreover, he recommends the employment of turpentine in the form of an electuary, with honey (ἐκλεικτόν, *Hippocrates*—ἔκλειγμα, *Aretaeus*:

Pliny[1] as a Latin author may be particularly cited, indicate their knowledge of its possessing many other important properties.

Coming down to the modern history of Turpentine, we meet with a subject naturally complex, from the circumstance that there are *many* officinal substances derived from the coniferous plants. A very clear and instructive narrative of the natural and chemical history of the Terebinthinæ is given by Dr Christison in his Dispensatory, and the previous labours of M. Guibourt[2] and Dr Pereira are by him both acknowledged and rendered further available. The last mentioned authority, Dr Pereira, in his able discussion of turpentine, has found it most convenient to treat of the coniferous terebinthinates under four heads:—1. The oleo-resinous juices. 2. The volatile oil obtained by distillation. 3. The resinous residuum. 4. Tar and pitch. In a closely similar manner Dr Christison considers *seriatim* the various substances admitted into the pharmacopœias, and in the following order:—Frankincense, with its modification, Burgundy pitch, common turpentine, Venice turpentine, Canada balsam, resin, oil of turpentine, tar, and pitch. Of these, frankincense (*Thus Americanum*), Burgundy pitch (*Pix Burgundica*), Canada balsam (*Terebinthina Canadensis*), resin (*Resina*), oil of turpentine (*Oleum terebinthinæ*), and tar (*Pix liquida*), find their places in the British Pharmacopœia; the Terebinthina vulgaris and Terebinthina Veneta are excluded. Among the substances now named, the oil distilled from the oleo-resin turpentine, which, again, is obtained from various pines, is a most valuable therapeutic agent, possessing actions on various organs and structures of the body which render it available in the treatment of disease. To these, attention will be directed after a brief consideration of what is known regarding the physiological action of the drug. The ultimate physiological action of oil of turpentine may be said to be twofold; it is irritant and stimulant. But these actions embrace others which turpentine very notably possesses, and we observe that, according as its irritant action is exerted on the intestinal canal, the urinary organs, or skin, it is a cathartic, a diuretic, or a diaphoretic. As a stimulant, it acts in producing, when a moderate dose has been taken, a by no means disagreeable sensation of warmth in the stomach, which is sometimes diffused over the greater part of the abdomen

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literally, a medicine which melts in the mouth),—a method of administration of the remedy, the mention of which (in the words of the French writers already quoted, "remise en honneur de nos jours") gives increased interest to the Hippocratic passage; finally, turpentine is noticed as affording relief to pain when simply applied to the side, or used as an ointment in pleurisy.

[1] C. Plinii Secundi Naturalis Historiæ, Tomus Secundus. Lib. xiii., cap. vi. De Terebintho; also lib. xxiv., cap. vi. In the latter, there occur the following sentences: "Terebinthi folia et radix collectionibus imponuntur. Decoctum eorum stomachum firmat. Semen in capitis dolore bibitur in vino, et contra difficultatem urinæ. Ventrem leniter emollit. Venerem excitat. Piceæ et laricis folia trita et in aceto decocta dentium dolori prosunt."

[2] Histoire Abrégée des Drogues Simples, tome second, p. 339.

and chest. It quickens the circulation, and augments the temperature. Moreover, in limited doses, it unquestionably produces a stimulating action on the brain, giving rise to impressions which closely resemble those produced by alcohol, and with these an ability for sustained mental as well as physical exertion. Should the quantity taken or administered be more considerable, it may cause remarkable effects on the sensorium. Such has been known to produce disorder of the intellectual functions, nearly identical with intoxication. Dr Copland, in his own person, realized this condition. Sir Thomas Watson also speaks of a patient who was supposed to be dying, but was found to be only intoxicated by the free dose of turpentine which he had swallowed.[1] Occasionally the oil has been observed to cause sleep. Indeed, a remarkably soothing influence on the nervous system is a by no means uncommon result of the administration of turpentine. Purkinje noticed this. The same has been experienced by others after taking the oil in doses of a drachm. Dr Andrew Duncan observes, "I have seen large doses produce temporary intoxication, and sometimes a kind of trance, lasting twenty-four hours, without, however, any subsequent bad effect."[2] Applied to the skin, turpentine produces rubefaction, and sometimes a vesicular eruption. A scarlet eruption over the skin has also been observed to succeed the internal administration of turpentine. That the external application may be followed by cutaneous absorption is evident from the distinct odour of turpentine in the breath of some persons, over whose chests or other portions of the trunk the warm terebinthinate epithem has been placed. In the same way the peculiar, indeed distinctive, odour communicated to the urine by turpentine, that of violets, may be produced. The violaceous odour of the urine here referred to, depends on a portion of the oil having undergone a chemical change in its passage through the system; but while this is taking place, it also appears that some portion of the oil leaves the economy by the urine altogether unchanged. This is illustrated in the experiments by Moiroud on horses, to whom turpentine had been given for some days, in the enormous dose of ten or twelve ounces.[3] It is not by the kidneys alone, however, that the absorbed turpentine is eliminated. The skin and the bronchial surfaces act in a similar manner. After the administration of a few doses, it may be even a single dose, if large, there is a distinct odour of turpentine recognisable over the cutaneous surface, and in the breath. It may be further observed, that, while the violaceous odour of the urine is produced after the earlier doses of the remedy, in cases in which its continued administration has been practised, the urine ultimately comes to have an odour altogether terebinthinate, the by no means disagreeable aroma, resembling violets, being lost. This effect may, in all probability, be accounted for by the more pungent odour of the turpentine concealing the aroma, during the increased elimination of the remedy by the kidneys, for the result of a suspension of the administration of the turpentine is the restoration of the violaceous odour to the urine before the final disappearance from it of all characteristic smell. The persistence of the violaceous odour is a notable feature. That produced by a single small dose of turpentine may be readily detected in the urine for eight-and-forty hours. It is much more persistent than many stronger odours which the urine acquires from the ingesta, as, for example, from asparagus. A further effect of turpentine is irritation of the urinary organs, leading not unfrequently to hæmaturia; and apart from any idiosyncrasy or special susceptibility to the irritant action of turpentine on the kidneys, which is possessed by some few individuals, there appear to be two modes of administration, after either of which the hæmaturia may come. It may succeed the use of the remedy, in a large or considerable dose, given probably with the view of producing catharsis. Here the remedy has either been wholly directed to the urinary organs, the intestinal canal escaping its influence, or, reaching the latter and failing to exert any effect, it has been reabsorbed, and ultimately attracted to the kidneys. This view seems borne out by the circumstance, that, while in one instance the hæmaturia is produced very speedily after the administration of the turpentine, in another, a considerable time has elapsed before the occurrence of the usual irritation. There is one other interesting circumstance in connexion with the action of turpentine on the kidneys. It would appear that the production of the violaceous odour may, to a certain extent, be taken as a test of the integrity of these organs. However the drug has been introduced into the system, whether by the mouth or rectum, from the skin, or by inhalation, this seems to hold good; but the most delicate test is that by cutaneous absorption, and it admits of being proved that a shorter time elapses till the odour in question is produced, and when produced, the odour is infinitely more distinct, when no symptom or indication of renal disease is in existence, than when the converse obtains. There may be reason in avoiding the use of turpentine as a counter-irritant in cases where the kidneys are unsound, and the caution regarding its use, which is expressed by some writers, Dr George Johnston[1] for example, may prudently be acted upon; nevertheless, it is consistent with my own observation, that, when under such circumstances turpentine is employed as a rubefacient or counter-irritant, the elimination which succeeds its absorption by the skin is effected conspicuously by the bronchial mucous membrane, by the intestines, and probably also by the cutaneous surface.

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[1] Lectures on the Principles and Practice of Physic, vol. i. p. 663.

[2] The Edinburgh New Dispensatory, p. 553.

[3] In Pereira's Materia Medica, vol. ii. part i. p. 1188; also Headland on the Action of Medicines in the System, p. 79.

With these few observations on the physiological action of the drug, I pass to the consideration of its therapeutic actions and uses.

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[1] Diseases of the Kidney, p. 133.

There are certain therapeutic actions of turpentine to which a brief reference is alone required, experience having already incontestably determined its precise value as a remedy. Foremost among these may be noticed its operations as a *cathartic* and *anthelmintic.* As a simple cathartic, turpentine is rarely employed, and for the good reason that its action, even when administered in large doses, is uncertain. When combined with other purgatives, and more particularly castor-oil, a greater certainty of operation is secured. The combination now referred to is justly esteemed, and, as Dr Christison remarks, "has often moved the bowels in obstruction from long-continued constipation, after other powerful cathartics had failed." Dr Kinglake has particularly insisted on the efficient operation of turpentine in cases of obstinate constipation attended by exaggerated tympanitis, while Dr Paris has borne testimony to its value where the obstruction has apparently been dependent on affections of the brain. The anthelmintic virtues of turpentine are chiefly prized in tape-worm, and may be ranked with those of the liquid extract of the male shield-fern and pomegranate-root bark.[1] In the treatment of ascarides the remedy is chiefly useful when administered as an enema. It is also efficacious over the lumbrici. Turpentine is a *hæmostatic*—it arrests hæmorrhage. The interest attached to this action of the drug is increased by the consideration that it also causes one variety of hæmorrhage, hæmaturia. The condition which determines the escape of blood from the capillaries is, however, very different in the two cases. The one is an active hæmorrhage, due to the presence of the absorbed turpentine in the blood of the Malpighian capillaries, causing their irritation and rupture; while the other, that which turpentine cures, is of a passive description, determined in all probability by a neurosis of blood-vessels. Turpentine in the latter instance is an available remedy. I am inclined, from what I have witnessed of its action in cases of purpura hæmorrhagica, with which hæmaturia has been associated, to regard it indeed as the most available remedy. Its action I believe to be through the nervous system, controlling and regulating the current of blood in the minute vessels by stimulation of their contractility. In many, if not in all, of the different forms of hæmorrhage turpentine has been employed, and a strong testimony has been borne by many experienced physicians to its value. Thus, in treating of the means we possess for the arrestment of pulmonary hæmorrhage, Dr Wood of Philadelphia remarks: "Another hæmostatic medicine, which sometimes acts very promptly and efficiently in hæmoptysis, is oil of turpentine. How it operates is not well understood, though probably by some influence on the capillaries, perhaps through the sympathetic nerve-centres. It is applicable to cases without inflammatory action or febrile excitement; and if plethora exist, it should be subdued before recourse is had to the oil. Mere frequency of pulse does not contraindicate it. I have found no remedy more efficacious than this under circumstances favourable to its use. In one apparently desperate case I succeeded after failure with all other means. Ten drops of it may be given every hour or two. If the hæmorrhage is very copious, the dose may be much larger."[1]

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[1] "As perhaps the most effectual remedy we possess for the expulsion of tape-worm, oil of turpentine stands deservedly in high repute."—*Neligan's* Medicines, their Uses and Modes of Administration. Edited by Dr Macnamara. 6th edition, p. 47. "Oil of turpentine appears to be the best remedy for expelling tape-worms; it is usually given in large doses for this purpose, but I have sometimes found that it fails when thus given, while the continued use of it in small doses succeeds in expelling the parasites. Thus, in the case of the late Mr Williams, the apothecary in Charlemont Street, ten drops given three times a day, and continued without intermission for six weeks, expelled a long tape-worm, which had resisted the same remedy in large doses."—*Graves's* Clinical Lectures, Lecture 53. "Oil of turpentine unquestionably acts as a most virulent poison upon the entozoa, especially upon the tape-worm, which it expels lifeless and livid."—*Paris*, Pharmacologia, p. 354.

In hæmatemesis, as well as in hæmoptysis, turpentine was much used by the distinguished John Hunter: in regard to the former, he states that he has seldom found it fail when given in doses of ten drops every two or three hours. In uterine hæmorrhage, the value of the remedy has been tested by many observers. Dr Copland remarks: "I have had recourse in extreme or prolonged cases to the spirits of turpentine, either in a draught or in an enema, or in the form of epithem or fomentation, applied over the hypogastrium, and always with success. This practice was first adopted by me in 1819, in metro-hæmorrhagia occurring after delivery, and has been pursued by me in other hæmorrhages, whenever it was considered advisable speedily to arrest them. In 1820, I publicly recommended the treatment; and I know that it has succeeded with those who were thus led to employ it."[2] In the intestinal hæmorrhage of fever, in hæmorrhoidal flux, in epistaxis, and the profuse bleeding which occasionally succeeds the extraction of teeth, in the hæmorrhage from leech-bites and from wounds, internally administered and externally applied, turpentine has often proved eminently useful.[3]

As a *stimulant*, turpentine has been very largely employed in the advanced stages of adynamic fevers. In typhus, more particularly where there exists marked depression of the vital powers, the patient being sunk in the bed, with more or less of stupor or low muttering delirium, and coma evidently threatened, with very probably hiccough, subsultus tendinum, and tympanitic distention of the belly, there is no remedy we possess which is so capable of effectually rousing the vital energy. I appeal with confidence to the experience of physicians who have seen much of fever, when I affirm that, without turpentine, we should, in such circumstances, be, if not powerless, at all events deprived of our most useful and potent auxiliary. In connexion with the stimulating effect of turpentine on the nervous system, and through it on the vascular, there is to be taken into account its wonderfully soothing action on the nervous centres, how delirium and restlessness are overcome, and often completely subdued by its use.[1] Not only so, but even maniacal excitement has been similarly overcome. Dr Graves, in speaking of the administration of turpentine, under just such circumstances, remarks: "Hence the value of this remedy is very great indeed, for it not only opens the bowels (a point of considerable importance in such affections), but also removes tympanitis, and exercises a powerful influence in controlling and quieting the nervous system. I have seen persons' lives saved by a few doses of the oil of turpentine, and have watched its tranquillizing effect on the nerves with pleasure and surprise."[2] Dr Copland speaks of the spirits of turpentine exhibited in similar circumstances as "frequently productive of benefit."[3] Dr Murchison recommends the internal administration of turpentine in the extreme tympanitis of typhus; also in the hæmorrhage of enteric fever.[4] The eminent Swedish physician, Dr Magnus Huss, has emphatically indicated the reliance which may be placed in turpentine, as a remedy in the low forms of chest affection, the catarrh and pneumonia, occurring in fevers. He remarks: "I have a rather long experience of this treatment with turpentine, as I before said in the account of the treatment within the hospital in 1842, with respect to pneumonia typhosa, that the use of the turpentine in certain cases of typhus fevers is one among the greatest steps forward the medical art has made of late in the treatment of these forms of disease."[5] Nor is the language employed by Dr Murchison less assuring. He states: "Its effects in the bronchitis of adynamic fevers are sometimes marvellous. It ought to be given in doses of from ten to twenty minims, with fifteen to thirty minims of chloric ether or sulphuric ether, and half a drachm of spiritus juniperi compositus, in mistura acaciæ, mistura amygdalæ, or yelk of egg. The dose may be repeated every two hours at first, until the desired effect be produced. After a few doses the patient often begins to cough and expectorate large quantities of viscid mucus, with great relief to the respiratory symptoms. The quantity of urine is likewise increased. I have never known strangury produced."[6] Dr Wood of Philadelphia, to whose confidence in turpentine as a hæmostatic reference has already been made, uses the remedy largely in the treatment of typhoid fever. He observes:

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[1] A Treatise on the Practice of Medicine, vol. ii. p. 329.

[2] Dictionary of Practical Medicine, vol. ii. p. 113.

[3] See Terebinthinæ Oleum, in Manual of Practical Therapeutics, by Edward J. Waring, M.D., p. 724.

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[1] Dr Dewees found the spirit of turpentine, in doses of twenty drops, procure sleep in cases of uterine cancer, when it could not be obtained from opium.—Diseases of Females, p. 274.

[2] Op. cit., p. 101.

[3] Dictionary of Practical Medicine, vol. i. p. 1037.

[4] Treatise on Continued Fevers, pp. 286, 575.

[5] Statistics and Treatment of Typhus and Typhoid Fever; from twelve years' experience, gained at the Seraphim Hospital in Stockholm, 1840-1852, by Magnus Huss, M.D. Translated from the Swedish original, by Ernst Åberg, M.D., p. 139.

[6] Op. cit., p. 283.

"Should the tongue become very dry, and the abdominal distention remain undiminished, the oil of turpentine will prove an excellent remedy. I cannot too strongly impress upon the profession my convictions of the importance of this medicine. It may be employed in all cases in the advanced stages of this disease when the tongue is dry. But there is a particular condition, and that a not uncommon, and sometimes a very dangerous condition, in which I have often employed it, and hitherto have seldom known it to fail." Dr Wood here refers to cases in which the tongue, after cleaning, wholly or partially, becomes quite dry, while with this change in the tongue there is generally associated aggravation of other symptoms, but particularly of the tympanitis. Turpentine, administered under such circumstances, acts as a stimulant, but also, Dr Wood believes, as an "alterative to the ulcerated surfaces in the intestinal mucous membrane." The usual dose is ten drops every two hours. It may be given in doses of from five to twenty drops every hour or two. Summing up the evidence which he has collected in regard to the efficiency of the remedy, Dr Wood, whose enthusiasm in its praise at least merits most attentive consideration, concludes: "I will repeat that the oil of turpentine may be used with great hope of benefit in any case of enteric fever, in the advanced stages, with a dry tongue, but, in the cases above referred to, with great confidence of success, so far as an experience of more than thirty years may be admitted as a ground of confidence."[1]

There is another form of fever in which turpentine has been frequently employed, and by many physicians with success—namely, *puerperal fever*. Dr Brenan of Dublin, in 1814, was the first to use it in this disease, in doses of one or two tablespoonfuls every three or four hours, and sweetened; the application of turpentine stupes over the abdomen being also practised. It may be admitted that some of the more distressing symptoms of this disease, more particularly the tympanitic distention of the abdomen, may be effectually relieved by the remedy. The testimony of certain writers subsequent to Brenan, Douglas, and Kinneir, who, like them, upheld the employment of turpentine as almost a specific, has, however, not been confirmed by Dr Gooch,[2] Dr Copland, Sir Charles Locock, and Dr Churchill.[3] Dr Craigie remarks: "It does not appear, however, either to be alone adequate to the cure of this disease, or to possess any specific powers over the morbid action. It is by no means even always capable of assuaging the violence of the vomiting or the abdominal pains."[1] I am aware that, by some physicians, turpentine is still regarded as the "summum remedium" in this very serious disease, and I feel satisfied that I have witnessed good effects from its use. It is possible that a consideration of some topics which follow may tend to strengthen the reliance which may be placed in its virtues.

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[1] Op. cit., vol. i. p. 359.

[2] "Although I have been unsuccessful in the use of turpentine in peritoneal fevers, the testimony of competent witnesses convinces me that there is a class, or perhaps a stage, of these fevers, in which oil of turpentine, given internally, is sometimes highly efficacious, and that cases apparently hopeless have been recovered by it."—An Account of Some of the Most Important Diseases peculiar to Women, p. 103.

[3] "Having frequently employed the spirits of turpentine in the more malignant states of fever, and being aware of Dr Brenan's recommendation of it for the malady, I next prescribed this substance, both by the mouth and in enemata, trusting to it principally, but without obtaining from it all the advantages which I had expected. It should, however, be stated that frequently I was not called to a case until it was far advanced."—(Op. cit., vol. iii. part i. p. 536.) See on

There are many forms of *nervous disease* in which turpentine has been administered, and is still justly prized as a remedy. These include both painful and spasmodic affections, and likewise the more formidable convulsive disorders. In epilepsy, turpentine appears to have been earliest prescribed by Dr John Latham, an allusion to the subject being made in his work on Diabetes, published in 1811. A few years subsequently a strong testimony to the efficiency of the remedy in this disease was borne by the same writer, and by Dr Edward Percival of Dublin.[2] They had been accustomed to prescribe turpentine as an anthelmintic, and had found it effectual in removing the convulsive disorders which are sometimes connected with the presence of tape-worm or lumbrici in the intestines. A more general employment of the remedy, however, had satisfied them that, not when connected with worms alone, but when occurring as an idiopathic disorder, epilepsy may be removed by turpentine. By the physicians now named turpentine was exhibited in *large* doses. It is in reference to their practice and that of other English physicians that Joseph Frank writes: "Oleum terebinthinæ in epilepsiis non solum a vermibus, sed et in aliis nerveis, et potissimum maniacorum, ad doses incomprehensibiles, recentiores Angli, utinam jure! commendant."[3] Subsequently the remedy came to be employed, not in large, but in small doses, and acquired to à considerable extent professional confidence; so much so, that we find Sir Thomas Watson remarking: "If I were called upon to name any single drug from which, in ordinary cases of epilepsy, I should most hope for relief, I should say it was the oil of turpentine. And I find that other physicians have come to the same conclusion."[4] There can be little doubt that the accomplished author, whose

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the same subject a lengthened and interesting discussion in "Traité de Thérapeutique et de Matière Médicale," par A. Trousseau et H. Pidoux, tom. ii. p. 602.

[1] Elements of the Practice of Physic, vol. ii. p. 241.

[2] Medical Transactions, published by the College of Physicians in London, vol. v. p. 65; also Edinburgh Medical Review, 1810.

[3] Praxeos Medicæ Universæ Præcepta. Partis secundæ, volumen primum, sectio secunda, p. 407. The following note is appended in illustration of the statement made by Frank in the text: ℞ Olei terebinthinæ, sacchari, āā unciam unam. Misce terendo, affunde aquæ menthæ piperitidis libras duas (!) S. Bis terve in die cochlear majus (!!). Vel, ℞ Olei terebinthinæ drachmas tres. Aquæ fontis libram unam. S. Omni quarta hora uncias duas. *Vide* The London Medical and Surgical and Pharmaceutical Journal, 1814, May.

[4] Op. cit., vol. i. p. 662.

words have just been quoted, entertains a different opinion now, and that he, like most physicians, would not be unwilling to subscribe to the statement of Dr Russell Reynolds—"Bromide of potassium is the one medicine which has, so far as I know, proved of real service in the treatment of epilepsy."[1] In *chorea*, turpentine as a cathartic, and likewise as an external application, has been highly recommended by Dr Copland[2] and other physicians. Dr James Jackson of Boston, U.S., in alluding to the treatment of chorea, says, "But the great remedy is the oil of turpentine. . . . In a severe case, however, or when other remedies fail, this should be used. . . . In a very young child, you may begin with five drops three times a day, but the dose should be increased steadily till relief is obtained, if no objection occurs. . . . A child of eight or ten years of age will sometimes bear a teaspoonful for a dose. This remedy is successful whether given early or late in the disease."[3] As an anthelmintic, turpentine deservedly holds its ground in the treatment of chorea, as well as other nervous disorders dependent on the reflex irritation which worms in the intestinal canal produce; but probably the opinion of Dr Radcliffe, as expressed in the following statement, will meet with little contradiction, in so far as the abandonment of turpentine is concerned: "Turpentine has been given for various reasons in chorea, as an anthelmintic and purgative chiefly. At one time I gave it rather as a general stimulant, and, as it seemed, with benefit to the patient. I then tried mineral naphtha with the same view, and came to the conclusion that this medicine was more pleasant than turpentine, less trying to the system, and not less efficacious. During the last six or eight years, however, I have rarely given either one or the other of these medicines, and one chief reason for this seems to be that I have gradually come to prefer the treatment of which I have to speak in a few moments."[4] That plan of treatment, as those familiar with the writings and practice of the eminent physician now referred to are aware, is "the free use of alcoholic drinks." For my own part, I am so thoroughly satisfied with the potency of arsenic in the treatment of chorea, as to esteem it above all other remedies. In tetanus, infantile convulsions, puerperal eclampsia, and asthma, turpentine has at different periods, and by different physicians, been employed as a remedy; in none of these, however, has it for any time, or with justness, retained its reputation as a therapeutic agent. It is necessary now to notice its employment in the treatment of nerve-pain, or neuralgia, in various of its forms. Of these, sciatica is the one in which turpentine has been chiefly used. The remedy is not new; Galen certainly used it; but Dr Cheyne of Dublin, and Dr Francis Home, were the earliest, in recent times, to employ it. The latter observes, "I have used it for many years, as an efficacious and valuable medicine."[1] Seven cases of pure sciatica are detailed, which were treated in the clinical wards of the Edinburgh Infirmary; of these five were cured, and the remaining two much relieved. Dr Home adds, "I have cured a great number of patients, in private practice, during the many years I have used it." He prescribed the remedy according to Dr Cheyne's plan, with a draught of sack whey or warm drink after it. The following is the prescription: ℞ Olei terebinthinæ, ʒij.; mellis optimi, ℥i. M. Fiat linctus. Capiat cochlear parvum mane et vespere. Superbibendo haustum potus communis tepidi. Dr Copland[2] speaks very favourably of the use of turpentine in sciatica, and also in other forms of neuralgia. In France, turpentine was largely administered, and highly esteemed as a remedy in neuralgia, by Recamier and Martinet; and although M. Valleix is not so sanguine in his appreciation of it, he readily admits its possession of notable therapeutic properties in this disease.[3] I have frequently employed it in sciatica, also in crural and brachial neuralgia, and with great benefit, so much so as to feel satisfied that, in turpentine, we possess a very valuable remedy for such disorders. I have, on several occasions, prescribed turpentine in cases of long-standing sciatica, in which the violence and lengthened continuance of the pain had greatly reduced the patient's strength, and in one or two instances had caused great debility. Ordinarily, I have used it when other remedies had failed; and in one case, which occurred this last winter, not only had many remedies failed, but the suffering of the patient was extreme and his prostration great. His recovery was complete after taking the turpentine for three weeks. It agrees well with old people, who are so frequently the sufferers from sciatica and other neuralgias. The dose varies from ten to thirty minims thrice daily. Usually I have prescribed twenty minims, to be taken in a little cold water, thrice daily. The *modus operandi* of turpentine in neuralgia, and particularly in sciatica, is, I am disposed to think, not unfrequently connected with its action on the intestinal mucous surface, with some irritation of which the painful nerve affection is not unfrequently connected. The same remark applies to irritation of the kidney as a cause of sciatica, in which case Sir Thomas Watson has conjectured turpentine does most good.[4] In illustration of this I may refer to an experience by no means uncommon, that after a brisk action of a cathartic, and for this purpose none is more suitable than the combination of turpentine and castor-oil, a severe attack of sciatica has been entirely removed. A better understanding of its action, however, as a remedy will, I hope, be suggested by some considerations which are to follow.

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[1] A System of Medicine, vol. ii. p. 280.

[2] Medical Dictionary, vol. i. p. 334.

[3] Letters to a Young Physician just entering upon Practice, p. 86.

[4] Reynolds's System of Medicine, vol. ii., article Chorea, p. 138.

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[1] Clinical Experiments, Histories, and Dissections, 1783. Experiments upon the Effects of the Oleum Terebinthinæ in the Sciatica, p. 265.

[2] Op. cit., vol. ii. p. 891.

[3] Valleix, Traité des Névralgies, p. 632.

[4] Op. cit., vol. i. p. 733.

Turpentine enemata are likewise useful in sciatica. As an external application in all neuralgic affections, turpentine acts much more efficaciously than the mere counter-irritant and rubefacient effects which it produces will serve to explain; the remedy is absorbed, and in some way or other operates through the blood on the pained nerve. "I have known oil of turpentine," remarks Dr Pereira, "now and then act most beneficially in sciatica, without giving rise to any remarkable evacuation by the bowels, skin, or kidneys, so that the relief could not be ascribed to a cathartic, a diaphoretic, or a diuretic operation." This statement exactly expresses the experience which I have had of the remedy in the same disease. I venture to believe that the efficiency of the drug, when applied externally, in bronchitis, pleuritis, and pneumonia, also in laryngitis, in which Dr Copland highly prized it, and in abdominal inflammation, admits of a similar explanation, that there is inherent in turpentine a remarkable power of restraining inflammatory action. In *chronic rheumatism*, and in *lumbago*, the oil of turpentine has been largely employed, more especially as an external application; it has also been administered internally. The stimulating and diaphoretic properties of the drug appear to exert a favourable influence on these disorders, and more particularly when the subjects of them are old and debilitated; but unquestionably the remarkable curative power possessed by turpentine over neuralgias, and chiefly among these sciatica, does not extend to rheumatic disorders properly so called.

Bearing some analogy to neuralgia is the severe headache which is apt to occur in nervous and hysterical females. In this painful affection, occurring in young persons of a delicate excitable temperament, without any menstrual or leucorrhœal complication, Dr Graves placed great reliance on turpentine. He gave it in doses of one or two drachms, to be repeated according to its effects. The best vehicle, he adds, is cold water. Some will bear and derive advantage from two or three doses of this medicine in the day, experiencing from its use a diminution of headache, and removal of flatulency, together with a moderate action of the bowels and kidneys. There is, moreover, another class of sufferers from headache, and this composed of both sexes, who may be relieved by turpentine. I refer to the frontal headache which is most apt to occur after prolonged mental effort, but may likewise be induced by unduly sustained physical exertion, what may be styled the headache of a fatigued brain. A cup of very strong tea often relieves this form of headache, but this remedy, with not a few, is perilous, for, bringing relief to pain, it may produce general restlessness, and, worst of all, banish sleep. Turpentine, in doses of twenty or thirty minims, given at intervals of an hour or two, will not only remove the headache, but produce, in a wonderful manner, that soothing influence to which reference has already been made. One dose is not uncommonly sufficient, but it is rarely necessary to repeat the remedy for more than two or three. I willingly subscribe to Dr Graves's statement, that it is best given in cold water; and have further to urge, that neither the physician nor the patient need be deterred from employing it, from the highly exaggerated notions which have been entertained regarding its disagreeable taste and liability to cause sickness.

In *diseases of the eye*, turpentine has long been a favourite remedy, chiefly in iritis and inflammation of the choroid membrane. In the rheumatic and syphilitic iritis, it was first strongly recommended by Mr Carmichael, in doses of a drachm thrice daily. Its effects in the treatment of inflammation of the eye may be uncertain, and may have disappointed the expectations of some surgeons; still there can be no doubt that, by oculists generally, turpentine is up to the present time regarded as a valuable antiphlogistic remedy.

Turpentine has been proposed by some writers as a *solvent of biliary concretions or gall-stones*;[1] but although undoubtedly useful as a cathartic and diuretic in jaundice, and as an external application in allaying and even in averting the attacks of gall spasm, there seems no good ground for accepting the action here referred to.[2]

As a local application in burns, in chilblains, and in ulcers of the limbs, turpentine has had its day; but in all of these, as well as in certain other affections, of which it is here unnecessary to make mention, more approved modes of treatment have of late years been adopted.

Reference has already been made to the employment of turpentine by the ancient physicians in affections of the mucous surfaces attended by copious secretion of altered mucus, in a single word, in cases of blennorrhagia, although that term has by some been erroneously restricted to discharges from the vagina or urethra of venereal origin. There can be no doubt that, in the *latter*, when they have become, or have threatened to become, chronic, turpentine is an available remedy. In bronchitis, however, attended by excessive muco-purulent secretion, its remedial virtues are seen most conspicuously. Sir Dominic Corrigan of Dublin, and Dr Waters of Liverpool, have used it, in doses varying from a drachm to an ounce, at intervals of two hours, in cases of severe or neglected bronchitis, connected with pulmonary emphysema, and attended by excessive accumulation of secretion in the bronchial tubes. I have seen the remedy signally serviceable in such circumstances. An emetic suggests itself as a likely means of affording relief, but the frequent feeble pulse, and the clammy surface of the body, with features almost collapsed, and livid lips, forbid its employment. Turpentine is then an alternative remedy, and it is a safe one; given internally, and diligently applied externally, it will not unfrequently reward the confidence which has been placed in it. In less urgent cases than those now briefly described, but still sufficiently serious, and often little amenable to cure, we have a remedy in turpentine; I mean in chronic pulmonary catarrh attended by fetid secretion. Again, in all cases of bronchial abscess, in pulmonary abscess, and in the formidable gangrene of the lung, turpentine may be hopefully employed, from what has already been observed of its effects. Many years ago, I was strongly impressed by witnessing the remarkable influence produced by small and frequently-repeated doses of turpentine in a case of pulmonary gangrene in the Royal Infirmary; and since then I have always prescribed it in such circumstances. Its action I believe to be stimulating, but also antiseptic, I had almost said specific. Speedily, under its use, the extreme fetor of the breath and expectoration undergo a change; then the latter becomes diminished in amount, while blood disappears from it, and with these changes a corresponding amelioration in the general condition of the patient takes place. Turpentine is borne, in these cases, in a way in which alcoholic stimulants are not. This fact I saw very strikingly illustrated in the case of a man about forty years of age, but of somewhat broken-down constitution, the subject of gangrene of the lower part of the right lung consequent on pneumonia. He was treated by thirty-minim doses of turpentine administered every second or third hour, continued for many days, and the result was most satisfactory. Skoda, the eminent physician of Vienna, has employed the inhalation of turpentine vapour in the treatment of the same disease. The oil of turpentine is poured upon boiling water, and the patient is directed to inhale the vapour every second hour for fifteen minutes at a time.[1] During the early summer of 1870 I saw, with Dr Somerville, a gentleman who, while convalescent from a severe attack of modified smallpox, had become affected by cough, fetid expectoration, and marked febrile disturbance. Over the upper part of the left mammary region, in this gentleman's chest, there was dulness on percussion, extending below into the region of cardiac dulness, and upwards into the subclavicular region, where it was less pronounced. On auscultation there was audible abundant coarse moist rattle, and the resonance of voice was much increased. Over the other portions of the chest the physical signs were normal. The patient complained of the extremely disgusting odour and taste of the expectoration, and was frequently caused to vomit after the effort of coughing had led to its discharge. He was ordered thirty minims of the oil of turpentine in a small wineglassful of cold water every third hour, and this he continued to take for several days. There occurred no disagreeable effects from the remedy, but speedily a notable diminution in the amount of the expectoration, while gradually its fetid character also disappeared. The doses of the turpentine were lessened in amount and frequency after the seventh day, but the remedy was not entirely discontinued till after the twelfth day from its commencement. In this case Dr Somerville and I noticed the diaphoretic, diuretic, and stimulant action of the turpentine, in addition to its very evident specific operation on the local disease. The patient, whose prostration was very great, while his appetite also was very feeble, had claret wine, but seemed to us to require no other stimulant than the turpentine. His ultimate recovery was complete. I have seen him lately, the picture of good health. I think it unnecessary to furnish the details of other cases similar or nearly so in their nature; but the following remarkable instance of recovery from impaction of a foreign body in the right lung, I need offer no apology for relating.

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[1] Durande's mixture, which was vaunted for this purpose, consisted of turpentine and ether.

[2] By its diuretic action the oil of turpentine may sometimes usefully influence the kidneys in cases where the epithelium is impregnated with yellow colouring matter, and consequently somewhat impaired in action.—Thudicum on Gall Stones, p. 286.

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[1] Fälle von Lungenbrand behandelt und geheilt durch Einathmen von Terpentinöl-Dämpfen. Zeitschrift der Kais. Kön. Gesellschaft der Aerzte zu Wien. 1853, p. 445.

In April 1866, I attended, with Dr Rutherfoord Turnbull, R. F., residing in Fountainbridge, who, when I first saw him, was expectorating a large quantity of extremely fetid purulent matter, stringy in appearance, and occasionally mixed with blood. This expectoration had been going on for some days previously, and was consequent upon a severe pain towards the lower part of the right side, with which the patient had been seized while at his usual occupation as a groom. There was no difficulty in recognising the existence of pulmonary condensation and evacuation. Its situation was a little below the middle part of the right lung, the physical signs being most distinct posteriorly. I recommended the employment of turpentine, and this, in doses of thirty minims every second hour, was forthwith commenced. It was continued for several days with manifest improvement in the general symptoms, which had previously indicated very considerable prostration. The fetid odour from the sputa, which had been more powerful and penetrating than anything I had before encountered, causing in myself invariably a feeling of nausea, and frequently in his wife, who assiduously nursed the patient, actual sickness, underwent a remarkable modification: not ceasing to be disagreeable, it became much more bearable. Up to the time, however, on which there occurred the interesting circumstance which I have now to record, I was unable to trace any change in the condition of the affected lung. The same dulness on percussion below the lower angle of right scapula, the same absence of all vesicular breathing, and the same somewhat distant but very coarse moist sound, with bronchial breathing and loud bronchophony over a limited space, were present, while the vesicular breathing in the upper portion of the right lung, and over the whole left lung, was greatly exaggerated or puerile. I had requested the patient's wife, his only attendant, to examine carefully the expectoration, and cautioned her not to allow any portion of it to be removed without her having subjected it to a careful scrutiny. This very unpleasant task she had performed with untiring zeal and faithfulness, when one morning, eight days after the commencement of the turpentine administration, she noticed in the sputa, which had been got rid of by an unusually severe fit of coughing, a small dark object, which she immediately removed, and presented to me on my next visit a few hours thereafter. The object thus handed to me possessed the same offensive odour as the expectoration and breath of the patient, was sodden in character, and appeared to be a twig or minute branch of a shrub or tree. Retained for a short time, it became firm, and ultimately hard, and was then readily enough identified as a small twig of a thorn-bush (fig. 1). Almost immediate relief succeeded the discharge of this foreign body from the lung, and the patient made a rapid as well as complete recovery. When I examined him some months after the illness now briefly narrated, and some little time after he had resumed his old occupation, I could discover very little wrong with his chest; a degree of dulness on percussion, and feebleness of respiration, alone indicated the site of his very serious lung disease. The narrative would be incomplete without the statement made to me by the patient, after the discovery of the "corpus delicti" in the sputa. He called to remembrance the sudden occurrence of a violent fit of coughing and choking, which was produced by something entering his mouth and passing downwards, when he was riding pretty rapidly through a dense wood in Aberdeenshire, with the wind in his face. This happened nearly six months before the commencement of the illness for which he requested the attendance of Dr Rutherfoord Turnbull.

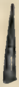

FIG. 1.

It may naturally be asked how the notion of the disease in this case, being dependent on the presence of a foreign body in the lungs, suggested itself to my mind? So interrogated, I have to reply, that there appeared to me something unusual in the whole history of this man's illness. The symptoms did not indicate the original occurrence of pneumonia which had terminated in gangrenous abscess, while the previous healthy condition of the patient, and the entire freedom of the left lung, and no inconsiderable portion of the right, from disease of any kind, made it evident that he laboured under no constitutional dyscrasia, of which the lung disorder was the prominent local manifestation. Further, I was from the first impressed with the very peculiar odour of the breath and expectoration. That differed from the strong and disagreeable smell attaching to both in ordinary pulmonary gangrene, and at the same time irresistibly reminded me of the odour which I had perceived in a case of pulmonary gangrene caused by the presence of a chicken-bone in the lung, under Dr Bennett's care in the Royal Infirmary in 1848, and of which a very interesting narrative has been published by Dr Struthers of

Leith.[1] Small as the foreign body in the case now narrated was, there are instances on record in which bodies equally minute entering the bronchi have given rise to alarming symptoms. Our late lamented friend, Dr James Duncan, in his interesting probationary essay for the Royal College of Surgeons, on "Foreign Bodies in the Air-passages,"[2] mentions one which occurred to Dr Donaldson of Ayr, in which an ear of grass entering gave rise to intense bronchitis, which continued for seven weeks, when the body was expectorated, and the person recovered.

The preceding observations appear to me to warrant the following conclusions :—(1.) That turpentine is a powerful stimulant, capable of rousing in a very remarkable manner the vital energies, while it, at the same time, produces a soothing influence on the nervous system. (2.) That, in all probability, we possess in turpentine an antiseptic agent, powerful in arresting, it may be in preventing, those morbid changes in the system which are evidently of a septic nature.

The other actions and uses of turpentine—its cathartic, anthel-

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[1] Edinburgh Monthly Journal of Medical Science, 1852, p. 449.

[2] Op. cit., p. 14.

Note.—The portion of mutton-bone (fig. 2) which is now exhibited to the Society was expectorated by a lady, a patient of Dr Struthers, to whose kindness I owe the opportunity of referring to it. In November 1869, this lady, while taking mutton-soup at dinner, and being at the same time engaged in speaking to her niece, a little girl, suddenly choked. The disagreeable and painful sensation then excited lasted for fully fifteen minutes, and gradually subsided, leaving her, however, satisfied that a piece of bone had entered the windpipe. On the Tuesday following the Sunday on which the accident took place, the voice became husky, and cough occurred. These symptoms, however, after the lapse of a few days, passed away, but she became subject to attacks of difficulty in breathing, some of which were very severe in character. They occurred at intervals, which rarely exceeded ten days. After some months she became weak, and the cough, which had returned, proved very irritating, and was attended by a scanty expectoration of phlegm. She had consulted medical men in different parts of the country, who regarded her case as one of ordinary bronchial disturbance, and listened incredulously to the tale of the choking fit and passage downwards of the bone. From Dr Struthers, for reasons of her own, she had purposely concealed all knowledge of the accident. Under his advice, she had, in the summer of 1870, gone to Crieff, and there, being seized with a severe fit of coughing, had brought up the portion of bone. For some days before this took place, she had observed her breath to be very offensive, and likewise the expectoration, which had then greatly increased in quantity. Dr Gairdner of Crieff, who had visited this lady when suffering from the severe spasmodic difficulty of breathing which preceded the discharge of the bone, had prescribed some medicine, which she believed to have facilitated its exit. Dr Struthers has informed me that, on careful examination of the chest, he had detected a roughness of the respiratory murmur, accompanied by wheezing sound, a little below the right sternal clavicular articulation. On the 26th of May 1871, ten months from the happy event just recorded, I had the opportunity of seeing the patient with Dr Struthers, and, on examination, failed to discover any evidence whatever of pulmonary affection; her recovery, which was rapid, had evidently also been complete.

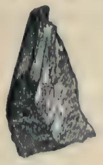

FIG. 2.

mintic, and hæmostatic virtues, have already been signalized, and I need not again refer to them here.

I am specially anxious to insist on the action turpentine possesses on the nervous system, by which it is rendered a powerful remedy in fevers of the adynamic type, in neuralgia, and not unlikely also in certain cerebral affections, including those of an inflammatory character; also on its antiseptic action, as evidenced by its remarkable influence on pulmonary gangrene and bronchial abscess. It appears to me as not improbable that pyæmia may be favourably influenced by turpentine, and that in this way its action in some cases of puerperal fever may be explained.

I am sanguine enough to believe that, in some cases of diphtheria and of putrid sore throat, we possess an available remedy in turpentine; and already I have seen it employed in the former, not, however, under circumstances which would justify me in drawing at the present time any decided conclusions from its use.

Part Second.

REVIEWS.

Lectures on Surgery. Parts III. and IV. By JAMES SPENCE, F.R.S.E., etc. Edinburgh: A. and C. Black.

THE third and fourth parts of Professor Spence's Lectures on Surgery have been published, so that the work is complete; and it gives us much pleasure to state, now that the whole scope of the undertaking can be reviewed, that our early favourable impressions, from perusal of the first two parts, have been confirmed, and our anticipations of still more valuable subject-matter being found in the remainder of the work, have been more than realized.

Parts III. and IV. are devoted entirely to the consideration of special operations and regional surgery; and here the learned Professor is manifestly not only at home, but seeming to revel in the practical magnitude of his theme.

It may be safely said, that though he has not rendered himself especially distinguished by devising any startling novelties in surgical practice, he has selected all that were useful from the teeming literature of past and present times, and modified and adapted them so as to bring them to perfection. The reasons for making such changes have been thoughtfully and philosophically argued, and leave a strong impression on the mind that, by following out the courses indicated, it will be best for the patient and the credit of the surgeon.

Where all is good, it is not difficult to select for special illustration some of the leading subjects so admirably treated by Professor Spence, and we would draw particular attention to his observations on tracheotomy in croup. We fancy no surgeon of the present day has had such extensive experience of this disease; and if he always acted on the rules for operating which he lays down in his book, he has been peculiarly fortunate in saving the lives of about a third of those who underwent the operation. To have saved thirty out of ninety subjected to tracheotomy for impending suffocation in diphtheria and croup, is a result of which Mr Spence may well be deemed worthy of congratulation; and it is evident, from what he tells us of the symptoms of gradual and certain asphyxia which demand the operation, that those thirty lives were snatched from an inevitable and most painful death.

Numerous methods for amputating at the shoulder-joint have been devised, and we propose quoting from Part III., page 800, the favourite and original method of Professor Spence, as it will be an excellent exemplification of the ingenuity, assisted by great anatomical knowledge, with which he modifies so as to bring to perfection various operations. Having seen the excellent stumps which resulted from this plan of procedure, we are the more disposed to speak in its favour. He says, "Supposing the right arm to be the subject of amputation. The arm being slightly abducted, and the head of the humerus rotated outwards, with a broad strong bistoury I cut down upon the inner aspect of the head of the humerus, immediately external to the coracoid process, and carry the incision down through the clavicular fibres of the deltoid and pectoralis major muscles, till I reach the humeral attachment of the latter muscle, which I divide. I then with a gentle curve carry my incision across and fairly through the lower fibres of the deltoid towards, but not through, the posterior border of the axilla. Unless the textures be much torn, I next mark out the line of the lower part of the inner section by carrying an incision, through the *skin and fat only*, from the point where my straight incision terminated, across the inside of the arm, to meet the incision at the outer part. This ensures accuracy in the line of union, but is not essential. . . .

"The advantages I claim for this plan are,—1st. The fulness and better form of the stump left after the healing, as shown in the results. 2d. The posterior circumflex artery is not divided except in its small terminal branches in front; whereas, both in the large deltoid flap and the double-flap methods, the trunk of the vessel is divided in the early steps of the operation, and, retracting, often gives rise to embarrassing hæmorrhage. In the case of the deltoid single-flap method, the vitality of the flap must be seriously compromised, as it depends chiefly on that vessel for its arterial supply. 3d. The great ease with which disarticulation can be accomplished."

There is one desideratum which we would like to see rectified in subsequent editions of this excellent book; for though the objection may seem trivial, it is a source of much annoyance and irritation, not to find any description of the plates except what is at the beginning or end of the parts. The letterpress indeed seems to treat the plates with marked indifference. Throughout our reading we have rarely come upon any special allusion to the figures represented. This may not be particularly aggravating to the advanced surgeon, but to the student, who really requires his memory to be sharpened by sights of the various important structures he is reading about, it must be very embarrassing. We would suggest that in future editions either the plates themselves should have footnotes, or that an extra explanatory page be inserted opposite them.

We would say, in conclusion, that the Lectures on Surgery by Professor Spence are the valuable contributions to a most important science and art of one who had a most extensive field for observation, and who has brought a natural shrewdness and wariness of perception, to act in conjunction with unrivalled anatomical knowledge, in the production of a complete work of sound surgical instruction.

The Cell Doctrine: Its History and Present State. For the Use of Students in Medicine and Dentistry. Also a Copious Bibliography of the Subject. By JAMES TYSON, M.D., Lecturer on Microscopy in the University of Pennsylvania, and on Physiology in the Pennsylvania College of Dental Surgery, etc. With a coloured plate, and other Illustrations. Philadelphia: 1870.

THIS is a little book of 150 pages, of which 117 are taken up with a statement of the views of different microscopists on the cell theory, and the remainder with the bibliography of the subject. We do not know whether many more books or papers could be added, though some could be struck out. What is the use, for example, of swelling the list by the title of Cuvier's Leçons sur l'Anatomie Comparative, Paris, 1808? or Bichat's Anatomie Générale, Paris, 1801? Neither Cuvier nor Bichat expounded the cell theory in these famous works. One might just as well put in Lucretius de Rerum Natura, Rome, B.C. 60.

We have a very carefully prepared history of the growth of the cell theory, in which an attempt is made to discriminate the merits of Robert Brown, Schleiden, Schwann, and others.

The following passage may awaken some interest among our readers, referring to a man whose remarkable mental and moral endowments made so deep an impression on those who came in contact with him:—

"We think it proper, in a historical memoir of this kind, to refer to some severe critical remarks which appeared in the *Edin-*

burgh Medical Journal of February and April 1869, in which Prof. Virchow is accused of appropriating the observations of Prof. Goodsir as his own. That there are points in common will be recollected, and also that these are, *first*, the invariable origin of cells from previously existing cells; and, *second*, the division of the tissues into cell territories. Now, on the one hand, we deem that the dedication of Virchow's volume to Prof. Goodsir is as handsome an accredit as could possibly be given for whatever of common there may be in the writings of the two authors; and, on the other hand, we have seen that Martin Barry is acknowledged even by Goodsir to be the author of the 'first consistent account of the development of cells from a parent centre.' The idea of *cell territories* seems, however, to have originated with Goodsir; nor do we believe, for the reason stated, that Virchow intended to usurp his prerogative. The merit of Virchow consists in his application by actual demonstration of the first of these points to so large a variety of physiological and pathological processes; to which is added original conception in the prominence given to the connective tissue corpuscle and the canalicular system, whatever may be the truth with regard to either."

The author gives a clear and interesting account of the views of the German and French histologists, as of the English physicists like Huxley, Grove, and Tyndal. The author shows a great deal of reading, as well as a praiseworthy desire to do justice to the opinions he explains. The number of references is very large. The printer must have taken in a good stock of stars and daggers before he went to press.

Dr Tyson allows only ten pages to his own views, which in the main correspond with those of Dr Beale. He believes the cell to be the ultimate anatomical element of organization, and that it is composed of matter in two states. The one state is found in the centre, often grouped into an oval nucleus, and to it, with Dr Beale, he gives the name of germinal matter. This germinal matter may occur without taking the form of a nucleus, as in the "non-nucleated amœbæ and protogenes primordiales of Haeckel, the non-nucleated monads of Cienkowsky, and in the leaf of Sphagnum, in such algæ as Hydrodictyon, Vaucheria, and Caulerpa, and in young germinating ferns" (p. 115). This germinal matter is often structureless, but sometimes it is granular. The peripheral portion of the cell is called formed matter. It has not the property of multiplying itself. "It is, in fact, the portion of the cell in which alone function resides, since it is to the formed material of the muscle-cell that we owe the property of contractility; to the formed material of the nervous element that we are indebted for neurility; and to the formed matter of the epithelial cell that we owe its protective qualities; while the secretion of all glands, whether they subserve ulterior purpose or not, is the formed material of the respective gland-cells." The reproductive power of the cell exists in the germinal matter, the function in the formed material. Sometimes the formed material is structureless; sometimes, as in the striped sarcous matter of muscle, it has a well-marked structure. These two materials occur in varying proportion in different cells.

Dr Tyson does not wish to give up the old term, *vital force.* As Dr Alison used to say, "We know as much of vital forces as of any other." We talk of the forces of gravitation and electricity, nor can we prove that these are identical, and in the same way we have a right to speak of vitality. Prof. Huxley wants to call vital phenomena the properties of protoplasm, and the thoughts to which we give utterance, the expression of molecular changes in protoplasm. This is more easily assumed than proved. Huxley objects, that we have no more right to say that such changes take place through the guidance of a principle of vitality, any more than that the phenomena of water take place by aquosity. But then we can reduce the phenomena of water to certain properties shared in different degrees by the whole inanimate world. When we observe properties different from those of ordinary matter, we attribute them to a peculiar force, as long as we cannot resolve them into a general one. We say that sealing-wax when rubbed shows electrical forces or electricity, not cerous forces or cerosity. In the same way the living cell presents phenomena not shared by the inanimate world, and we have as much right to call these vital forces as Huxley has to call them molecular forces. When it is proved that all these are modifications of one force, that gravitation is but another form of electricity, and consciousness or reproduction due to the same force as gravitation or electricity, we shall perhaps adopt a more materialistic nomenclature. In the following passage this point is well stated:—"That there is something in this force or power, over and above the physical forces of nature, is most strikingly shown in the power, exhibited through its agency by germinal matter, of multiplying and producing new germinal matter out of pabulum unlike itself; for although a crystal may result from the re-arrangement of particles of a salt in solution, as sulphate of alumina, to an unlimited extent, there is no possibility, nor would any physicist contend, that it could produce crystals of its own composition out of carbonate of soda. Nor, as is justly contended by Dr Beale, should the cell be compared to a machine, unless that machine possess a power of producing new machines out of material unlike itself, and of endowing them with a similar power."

The Principles and Practice of Midwifery, with some of the Diseases of Women. By ALEXANDER MILNE, M.D., etc., etc. Livingstone, Edinburgh: 1871.

THERE have been many poets in the profession; but most, so far as we remember, have been exoteric. Among the esoteric medical poets is the well-known Citoyen Sacombe, who in "an vii." published "La Luciniade, Poëme en dix chants, sur l'Art des Accouchemens." Sacombe founded the anti-cæsarean school of obstetrics, had a fierce quarrel with Dubois and Baudelocque, and altogether played a queer part in the political and scientific world of his day. He suffered imprisonment at the hands of Napoleon, got his freedom at the Restoration, and died in 1822, his works already almost forgotten.

Dr Milne's work is remarkable for its literary peculiarities. He writes with an easy pen, intersperses his drier scientific matter with odd digressions, and also with snatches of poetry. Here, for instance, is a specimen of his verses, and also of a practice which is scarcely worthy of the intended honour:—

> "If to the mother *you* the chlorate give,
> The child more certainly will thrive and live."

Here is a general principle of therapeutics:—

> "Try first the mild, then the more potent plan;
> Cure we may not, but oft appease we can."

Here is the function of the Fallopian tube described in verse:—

> "Like bird of rapine, ever on the watch,
> Rarely it fails the ovulum to catch,
> But if the little embryo it spills,
> We have an extrauterine case, with its sad ills."

Here he settles the great blood-letting question, in connexion with the treatment of puerperal peritonitis:—

> "Our worthy sires bled rather fast,
> And now we let the lancet rust;
> But if to one extreme they ran,
> Have we not to the other gone?"

We must rest satisfied with these quotations of our author's poetry, and leave it to our readers to judge of their literary merits, having ourselves no skill in the poet's art.

Dr Milne is evidently of the Edinburgh School, and we trust this will nowhere be held as to his discredit. Though this is his home, he dedicates his book to Scanzoni, and evinces, in a variety of places, some degree of acquaintance with the rich obstetric literature of Germany.

His book has a remarkable peculiarity, which is not convenient. It is his mixture of some of the diseases of women, or, in modern nomenclature, some parts of gynækology, with obstetrics. This mixture appears very like confusion, for, in truth, the things do not amalgamate at all. Had he given all, or most of, the diseases of women, it would have been another matter.

We ardently wish that we could foresee a time when obstetrics might be taught in verse. The science must wait long before it can be set to music. There are too many discords, too many gaps, in the obstetrical scale at present. Obstetricians only waste time when they try to write a Luciniade. Laborious, often painful and long-continued observations, and then other means of philosophizing, are the true occupation of those who wish to advance this study. Above all things, they must not set out in search of practical results. They must remember that it is necessary to know, before it is possible satisfactorily to treat. Exactness of knowledge, then, must precede satisfactoriness of treatment. And we may ask our brethren, Where, in midwifery, can we even now say we have exactness of knowledge? We are accumulating stores, however, and Dr Milne has, in this work, made some contributions to them.

On the Pathology of Club-Foot and other Allied Affections. By JAMES HARDIE, M.D., Surgeon to the Clinical Hospital, Manchester.

WE have studied with much interest this suggestive essay, and consider it to be a valuable addition to the pathology of Club-foot.

The author's observations are founded on the examination and dissection of a curious malformation affecting both the upper and lower extremities of an infant. Having described this case, and referred to the theories which have been given to explain the cause of congenital club-foot, Dr Hardie advances "arrest of development" as the most probable source of such deformities. In order to explain the author's use of this term, we quote the following passage:—

> "By 'arrest of development,' I do not mean that the muscles and other structures on the contracted side of the joints have at some period ceased to grow, and have remained of a lower grade of development, or have possibly undergone a degeneration of structure. Dissection of the parts sufficiently disproves any such hypothesis. We find the muscles, ligaments, and surrounding tissue exactly of the same structure as in the normal condition. The only difference that can be perceived is that they are formed on a smaller scale than they should have been, and if, by the term 'arrest of development' some have understood the former condition as existing, I can at once agree with Adams and others in regarding it as a myth. But if, by the term, we signify only what every one admits—structural shortening—and then go back and substitute one kind of nervous influence for another as the cause of this,—the influence, namely, of some peculiar perversion of the excito-nutrient system of the mother for some peculiar irritation of the nervous centres of the fœtus, as is the supposition necessary in the former theory,—then I see nothing in the anatomy of the parts nor in the reasoning to warrant the complete rejection of this theory, which it has of late years received."

The author supports his views by reference to the association of club-foot with other deformities, to the occasional hereditary nature of club-foot, and to what, in our opinion, is the most valuable, the important investigations of Eschricht and Volckmann in regard to the development of the fœtus. In connexion with the practical bearing of these observations on the treatment of club-foot, Dr Hardie remarks:—

"The bearing of this explanation of the cause of club-foot on its treatment is sufficiently obvious. Admitting its correctness, it is evident that not the muscles only, but the bones and ligaments are also involved in the abnormal condition from the first. Too much reliance, therefore, must not be placed on the efficiency of tenotomy. Surgeons believing in the muscles as the original cause of the mischief, and trusting too much to the relieving of the tension they exhibit, are sure of disappointment. We may infer, in a most intelligible manner, that tenotomy should only be regarded as a preliminary to treatment that has for its object the retaining of the joints in their normal position, for a period sufficiently long to allow of the bones and other structures growing into the shape that this encourages. In many cases this period must necessarily be very protracted, but considerable time may also often be saved by extending the use of the tenotome as much as possible to all the contracted tissues."

Chloroform Deaths. By W. W. Dawson, M.D., Surgeon to Cincinnati Hospital.

This little pamphlet, which contains the history of twelve hitherto unpublished cases of death from chloroform, is tolerably exhaustive of the subject, so far as it is yet known. It compares chloroform with other anæsthetics, and discusses the rate and cause of death, with the best modes of administration, and the best means of resuscitation. Quoting from an anonymous paper in the *Richmond and Louisville Medical Journal*, the author gives the following table, exhibiting the relative dangers from anæsthesia by chloroform, ether, etc., from the statistics of 208,893 cases :—

Sulphuric ether, ...	1 death to	23,204	administrations.
Chloroform, ...	1 ,,	2,723	,,
Mixed chloroform and ether,	1 ,,	6,588	,,
Bichloride of methylene, .	1 ,,	7,000	,,
Nitrous oxide gas, . . .	No deaths in	75,000	,,

These startling figures he believes to be too favourable for ether and nitrous oxide, while he thinks they hardly sufficiently present the fatality of chloroform. We certainly agree with the first part of this statement, but we as certainly demur to the last. One firm alone (Messrs Duncan, Flockhart, and Co., of Edinburgh) manufacture 1700 fluid ounces of chloroform daily. Now, setting aside one half for external use—surely an ample allowance—and allowing two fluid ounces as an average individual dose, which we think is fair, taking dentistry at one end of the scale and midwifery at the other, then we have this one firm manufacturing 425 doses daily; and taking 300 days as a working year, which of course is below the reality, we have them making 127,500 doses annually; and taking only one death in 3000, which, according to Dr Dawson, is far below the actual fatality from chloroform, then we have the chloroform produced by this one firm alone responsible for no fewer than 42 deaths annually. But chloroform is produced by other manufacturers in large quantities—80,000 lbs. annually in America alone; and though all chloroform deaths may not be recorded, yet, from the circumstances in which they usually happen, and their appalling character, but few can escape altogether unnoted; and yet, all told, do they amount to anything like 50 annually? It is quite true that Dr Richardson tells us that certain hospitals lose 1 case out of 2633 cases; so much the worse for those hospitals, say we; how much the worse may be learned from the fact that he tells us, that in certain other hospitals the deaths during the first few years amounted to the mere nominal mortality of 1 in 17,000 administrations, but that during the last few years the mortality in the same hospitals had increased to 1 in 1250 administrations. Suppose, in drawing lottery tickets, 17,000 blanks were drawn to one prize, and afterwards one prize to every 1250 blanks, would the public be satisfied that all was fair, and had been properly managed? Now, suppose they discovered that the one who drew the tickets had a number of prizes in his coat-sleeve, would they not insist that, whether wilfully or not, he had latterly been dropping his prize tickets into the bag out of his sleeve, and thus had increased their number greatly beyond the original intentions of the holders of the lottery? Events are always dependent on the causes which produce them, and chance, or accident, is but another name for our ignorance of those causes. A particle of dust floats at hazard, as we say, and yet La Place has shown that the curve described by it is regulated with as much certainty as the orbits of the planets themselves; and nothing but wilful ignorance could ever induce the members of a profession, which, by skill and care, has reduced the deaths from ovariotomy to about 1 in 30, instead of an almost invariable fatality, to assume that chance, accident, or any similar inscrutable umbra, should be responsible for so fearful an increase of mortality from chloroform as from 1 in 17,000 to 1 in 1250.[1]

Demurring to the larger number of deaths as certainly far in excess of what ought to result from the careful administration of chloroform, we may add that, even of the mere nominal mortality of 1 in 17,000, it is at least probable that all was not due to chloroform, for we know that sudden deaths during, or immediately after, operations were by no means unknown before the days of chloroform; and although it is probably impossible now to collect adequate data to fix their probable frequency, yet some approximation may be gained when we learn that during the first seven years after the introduction of chloroform, no fewer than five such deaths came under the immediate cognisance of Sir James Simpson himself.

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[1] The feeling that there is something to blame is not lessened when we reflect that in the French Eastern campaign, chloroform was administered 30,000 times, or more, without an accident; that in the English Eastern campaign, there were but two deaths, in an unknown, but much larger, number of administrations; and that, during the late American war, no accident occurred in 22,000 administrations of good English chloroform; subsequently, however, when the same surgeons were supplied with chloroform made from methylated spirit, several accidents occurred, although the same care and skill were employed. Vide *New York Medical Journal*, April 1871, pp. 407, 408.

It is somewhat remarkable that almost all the deaths from chloroform, so far as we know, have occurred when it was administered for some surgical operation, and that no deaths have been recorded as resulting from its legitimate use in midwifery.[1] Yet the parturient state itself presents no insuperable obstacle to chloroform-poisoning, for cases are known in which women have been poisoned while in labour by chloroform administered to them by non-professional parties, and the great reason of its safety under ordinary circumstances would seem to be that we have, in the action of chloroform on the uterine pains, a most efficient test of the saturation of the patient's system; for, as the heart's action remains unaffected long after the suspension of the uterine pains by anæsthetics, and as the slightest interference with these pains is the signal for the withdrawal of the chloroform, we have thereby established an almost complete immunity from sudden death from chloroform during labour. Could we discover some similar and equally efficient physiological test which could be employed during operations, a great step would be made to securing the safe administration of chloroform. Crying out, not conscious speaking, but mere crying, might be tried as such a test, for consciousness we know to be abolished long before the reflex act of crying ceases—a rabbit continuing to cry when pinched after its cerebrum has been entirely removed. Safety to our patients would be cheaply purchased by a little more noise in our operating theatres, in which the desire to keep the patients quiet and motionless has only too often resulted in their eternal rest. And yet there might be risk even in this test; because, unfortunately, screaming is not confined merely to the borderland immediately beyond unconsciousness, and we know that many distressing deaths have occurred apparently from the patient not having been sufficiently anæsthetized, probably from reflex spasm of the heart, as was pointed out long ago by Mr Bickersteth. A very remarkable instance of this is related by Dr Dawson. The patient was a lady aged thirty-nine, the mother of eight or nine children, who had taken chloroform in all her labours, and in her first had been under its positive influence for twelve hours; she had also frequently taken it for the extraction of teeth; and yet at last she died in the act of getting a tooth extracted, while only partially under the influence of chloroform, of which she had only inhaled about one drachm.

In spite of the risk involved in the use of chloroform, its great potency, prompt action, and the ease with which anæsthesia can be kept up by its aid for hours, will always constitute it the great favourite with the majority of the profession; indeed, in these respects, it has no rival but sulphuric ether, to which there are many objections, while there is every reason to fear that, were it equally freely and carelessly administered as chloroform, the deaths from the one would not be much, if any, behind those of the other. In 1867, a death from ether occurred at Lyons, and on discussing this death at the Academy of Medicine there, it was found that in the short period—a few months—during which the medical men of Lyons had given up chloroform and employed ether, no fewer than seven deaths had occurred, while the same figure expressed the total number of deaths from chloroform in Paris during fourteen years. Our author relates several other cases of death from ether, and holds out no very flattering inducements to return to ether.

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[1] Forty thousand such cases without a death have been recorded in London alone.

Nitrous oxide, of course, is only admissible for short operations, such as tooth extraction; but for these it seems to be by far the safest agent, though by no means perfectly innocuous, at least one death being already on record.

Mixtures of chloroform and ether are vaunted by some as more free from danger than chloroform alone, but as they are mere mechanical mixtures, it would seem to be more rational to give them separately, producing the anæsthesia by ether, and keeping it up by chloroform, if there is any safety in the use of two distinct anæsthetics, which seems at least doubtful.

The other anæsthetics have been comparatively but rarely tried, but the only death as yet recorded from the bichloride of methylene was a man of forty, and in vigorous health.

Dr Dawson includes all deaths from chloroform under the three heads of sudden, gradual, and secondary. The first category comprises, of course, by far the larger proportion—those who have a fair pulse and steady respiration up to the very instant that both cease. The second includes those few cases in which the heart and lungs show feebleness of action, then cease to act and again resume, arrest and resumption of these vital functions alternating sometimes for minutes and sometimes for hours before the patient's death. While, as an example of what he terms secondary death from chloroform, he gives the case of a patient who, when roused from the complete anæsthesia, "at once resumed the vomiting which had been inaugurated by the first inhalation of the vapour, and which terminated her life on the sixth day;" this case being precisely one of those which would come under the category of chronic chloroform-poisoning, in which Casper includes all those who die apparently from the effects of chloroform after the lapse of hours, days, or weeks. As to the cause of death, the author recognises the heart as the organ most frequently smitten; in the vast majority of cases the heart is fatally paralyzed; but in some, of which he gives one remarkable instance, and mentions others, the heart seems stimulated to a fatal unrelenting contraction. In the case narrated the heart was empty, firmly contracted, and fatty; the patient (Bridget Henry) had gone easily over, and had been fully anæsthetized for one minute and a half before she died; only 75 minims of chloroform were used.

The lungs are the organs next in frequency fatally impressed, the poison acting directly on the pneumogastric nerves, and paralyzing them. In these cases the respiration ceases primarily, the heart continuing its action for a limited time. This form of disturbance in a minor degree is not unfrequently observed and rallied from by artificial respiration. The stomach, in some few cases, seems to be fatally affected, vomiting and retching ceasing only with the life of the patient; this is a common enough form of derangement after the administration of chloroform, but it only very rarely proves fatal. Dr Dawson also refers to the falling back of the tongue, favoured by the supine posture, as a source of death from apnœa; nothing but the grossest carelessness could account for this, and such deaths must be extremely rare. He also mentions death from coma, from an over-dose; such a mode of death must also be rare, and actual death probably occurs from a combination of various causes. No instances are given either of this or the preceding form of chloroform-poisoning.

In answer to the inquiry, What can be done to prevent these deaths? the author goes on to show that, from so many chloroform post-mortems having revealed fatty degeneration of the cardiac muscle, all authors on the subject exclude persons with a fatty heart, nevertheless, he adds, practitioners give them chloroform. For who can diagnose a fatty heart? Bridget Henry was plump, and had fat in abundance; she had a regular pulse, of fair force and volume, and a normal cardiac impulse; yet the post-mortem showed a fatty heart, which had not even been suspected, though carefully looked for. Moreover, we have considerable doubts whether all the chloroform hearts, said to have been fatty, have been so in an actually morbid degree; anxiety to shield themselves from the charge of carelessness, even more perhaps than their desire to defend the use of the drug, has led those who have been unfortunate to seek an excuse for the death in pathological alterations. Such an excuse seems to us problematical in the extreme; hundreds of hearts far more fatty, far more diseased in every way than those of the few unfortunates, have borne with impunity a moderate and even a considerable infusion of chloroform vapour. For the relief of cardiac pain, so common in heart disease, especially in aortic regurgitation, the inhalation of chloroform is a readily available form of relief, preferred by some to the nitrate of amyl or the subcutaneous injection of morphia, and it is not found to be a bit more dangerous or injurious than they are. In cardiac asthma, chloroform often rallies the apparently dying patient; and in the last case of angina pectoris we have seen, the only relief from pain the patient had for weeks before her death was got from chloroform inhalations, supplemented by hypodermic morphia injections. She died worn out at last at about eighty years of age, and at her post-mortem the orifice of the middle coronary artery—there were three in her heart—was found almost entirely blocked up by atheromatous deposit, and her heart not only thin-walled and somewhat dilated, but of a pale, almost yellowish tint, soft, and thoroughly fatty—no heart could be more so; yet chloroform produced in her no dangerous symptoms, and, far from shortening her days, certainly prolonged them.

After a careful inquiry into all the cases in which chloroform is said to be contraindicated, our author concludes that we can only decline persons labouring under a dilated right heart, and those ill of delirium tremens; but a dilated right heart being probably quite as difficult to diagnose as a fatty one, practically only those labouring under delirium tremens are to be excluded from the benefits of chloroform. The author also very properly adds, that much may be done to secure the safety of the patient by placing him in the recumbent position, by never giving the chloroform except on an empty stomach, three to four hours after a meal, by attending to the temperature of the room, and the proper administration of the vapour. He approves of giving spirits before the administration of chloroform in every case, as it encourages the strong and strengthens the weak; but he does not approve of employing subcutaneous injections of morphia, as recommended by Claude Bernard, to be employed in those having feeble hearts and in the habitually intemperate; and he does so mainly because, on the faith of one or two fatal cases reported, he regards it as almost equally potent for evil with the chloroform. This argument is not likely to have much weight. Hypodermic injections of morphia have also been recommended as preventive of sickness; but unless from some homœopathic principle, we cannot see how, as so used, morphia is perhaps even more frequently followed by sickness than chloroform. In regard to the manner in which chloroform should be administered, Dr Dawson remarks "that, although for the last few years the tendency has been to great dilution of the vapour by the means of apparatus, as essential to safety, yet the deaths seem to have been on the increase, and I doubt whether there is advantage in any of these appliances. It appears folly to talk about the positive safety of dilution when a vapour of from 3 to 4 per cent. kills, and kills in the same manner that chloroform pure, unmixed with air, does. Mrs Simmons, the second victim of chloroform (Cincinnati, 23d February 1848), who inhaled pure chloroform from Morton's inhaler, seems to have died in precisely the same way as did those who have perished under Snow's apparatus." The old-fashioned towel method, as employed in the United States army, has, he states, out of 80,000 administrations, been credited with only eight deaths. On the whole, however, the only point which he seems disposed thoroughly to insist on is, that the anæsthesia should be produced slowly; he seems to think that all observers are agreed on this—most are; but the present Professor Simpson of Edinburgh, and Dr Murray of Newcastle, seem to think that the patient can scarcely be brought too rapidly under the influence of chloroform; and our impression is that the late Sir James Simpson held similar views. In regard to the question, How far may the chloroform narcosis be carried?—by which he evidently means how long may it safely be kept up—he says that this is a most difficult question, as some die in an instant, while others sleep quietly for hours, and awake refreshed, and that it is not easy to get rid of the idea that there are some persons, and some states of the system, inimical to anæsthetics, else why should healthy, and comparatively healthy, persons die, and die under apparently the most careful and skilful administration? As to the means of resuscitation, the author declares artificial respiration to be the only reliable means; and in so saying he shuts out as hopeless all those whose hearts are primarily paralyzed. Of course he very wisely scouts the idea of stimulants applied to the face, skin, or rectum being useful where the knife and the cautery are unfelt; though such means may be useful when dangerous symptoms exhibit themselves while anæsthesia has scarcely commenced. As to the employment of electricity, he says that the statements of Onimus and Legros as to the employment of the continuous current, and the inutility of the interrupted current, are directly contradicted by the experiments of the Royal Medical and Chirurgical Society, and of Dr H. Culbertson, Ohio, who found the interrupted current perfectly efficient in restoring animation after anæsthetic suspension of the heart's action; so that the question of interrupted *versus* continuous current would seem to be *adhuc sub judice.* In conclusion, if we learn nothing else from this pamphlet, we learn this, that the most careful observers have had their reasoning faculties so paralyzed by contact with this subject as to believe that a rise of mortality from 1 in 17,000 to 1 in 1250 in a matter which depends so much on care and skill, may yet be due to some inscrutable idiosyncrasy, revealed by no external symptoms, and frequently associated with the highest health. It is as reasonable to suppose that arsenic or prussic acid kill only when their use is coincident with an idiosyncrasy. And the first step in the right direction will be to ignore the compassionate verdicts of ignorant juries, which invariably declare the administration to have been faultless, and to state boldly, with Mr Lister, that "just as railway accidents are generally occasioned by culpable mismanagement, so death from chloroform is almost invariably due to faulty administration." We have already, from the statistics of our great Scotch manufacturers, shown the high improbability that the deaths in Britain generally amount to so many as 1 to every 3000 administrations.[1] And Dr Squibb, in the May number of the *New York Medical Journal*, corroborates this, for he says that, in the United States, he finds last year only 17 deaths reported to 208,000 administrations, or 1 in 11,764; these administrations he calculates from the 80,000 lbs. of chloroform annually manufactured, by taking one-third as used for inhalation, and one ounce and a half for a dose. Possibly enough his calculations, as well as our own, may be erroneous; but coupled with the statistics of Dr Richardson, already referred to, they go to confirm the deliberate statement of Mr Lister, just quoted,—a statement which we must however supplement by another, and that is, that we do not—and we are also certain that Mr Lister does not—by "faulty," mean "culpable."

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[1] At that rate the deaths must have amounted to over 462 in eleven years, but the *British Medical Journal* for 24th June states that only seventy deaths have been recorded during eleven years, and that these comprise most of the chloroform deaths during that time, though certainly not all.

Report of the Vaccination Committee—Illuminated. By William Hume-Rotheby.

We have read this Illuminated Report, and wishing to let the public and the author know our opinion of it, and, at the same time, to keep clear as far as possible of all disagreeables, we think it wise merely to say that the author is an anti-vaccinator, and in regard to all such we quite agree with the following quotation from the *Spectator*:—"A rough remark in our last issue has brought down on our heads a storm of objurgations. We said that vaccination was decried by two or three scoundrels and a good many fools, whereupon we are asked whether we class Mr Newman among the scoundrels, or the late Dr Bedford among the fools; what we mean by publishing such falsehoods; why we are deluding the people; and all manner of amenities. The letters we could stand up against, but the deluge of tracts is too much; and so we give in, the more readily because the expression was inartistic. We beg, therefore, to declare that people who denounce vaccination in order to sell nostrums are not scoundrels, but only persons who risk human lives for gain; and that people who denounce vaccination from philanthropic motives are not fools, but only persons devoid of the faculty of weighing evidence."

Patents and Patentees: Victoria. Vol. I., from 1854 to 1866. Vol. II., 1867. Vol. III., 1868.

Abstracts of Specification of Patents applied for from 1854 *to* 1866: Victoria. Ac to Ba.

Abstracts of English and Colonial Patent Specifications relating to the Preservation of Food, etc. By William Henry Archer, Registrar-General of Victoria. Melbourne: 1870.

These interesting records are of course insusceptible of being reviewed in the short space we could allow, and we merely mention their titles to say that they have been placed in the library of the Royal College of Physicians, where those interested may consult them.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION L.—MEETING XII.

Wednesday, 7th June 1871.—Dr BENNETT, *President*, in the Chair.

I. *Professor Lister* made an oral communication in connexion with three cases which he exhibited. The first was an example of A HAND with all its natural movements, and of full strength, after excision of the wrist for caries. The second was an illustration of a new principle of treatment of CERTAIN DEFORMITIES resulting from contracted cicatrices, and also of the antiseptic management of the wound. The third was an instance of recovery after PRIMARY AMPUTATION AT THE HIP-JOINT, promoted, as it was believed, by antiseptic management, the difficulties of which, under such circumstances, had been overcome by the use of the means exhibited. [This communication will appear in full in our next number.]

II. *Mr Annandale* showed a LITTLE GIRL, nine years of age, who had been under his care for two months, on account of aggravated congenital talipes varus of both feet. He exhibited casts of the feet taken before any treatment had been adopted, and pointed out the satisfactory results which had been obtained by the employment of the means which he had recommended at a late meeting of the Society.

III. *Mr Annandale* also showed a BOY, illustrating an example of conservative surgery of the hand.

IV. *Dr Fraser* exhibited a QUANTITY OF WATER from the newly-discovered acidulous chalybeate spring of St Dunstan, Melrose, for the opportunity of showing which he was indebted to the kindness of Mr Dewar, Demonstrator of Practical Chemistry in the University. The constitution of this water proved it to be at once a most admirable and a most agreeable ferruginous tonic, one which had probably no equal in Britain, and very few superior elsewhere. The following are its constituents per gallon, according to Mr Dewar's analysis :—

Carbonate of iron, . . .	17·5	grs.
Alumina, ...	1·8	„
Silica, ...	8·5	„
Sulphate of magnesia, . .	7·8	„
Chloride of calcium, . .	16·	„
Carbonate of lime, . . .	4·1	„
Other alkaline chlorides, . .	11·4	„
Total solids, . .	67·1	grs.

Carbonic acid, 40 cubic inches per gallon.

V. *Dr Miller* showed a PREPARATION OF THE CERVICAL COLUMN, WITH AN INJURY OF THE TWO UPPER VERTEBRÆ, caused by a fall on the feet. The atlas was dislocated backwards upon the axis, with rotation to the left side, and there was fracture of the left lamina of the latter bone. No injury to the base of the skull could be found. The tarsus in both feet was completely smashed up.

VI. *Dr Argyll Robertson* exhibited TWO EYES, one of which exhibited fatty degeneration of the retina, the result of albuminuric retinitis, while the other presented a very remarkable and interesting example of ossification of the choroid. The latter had been removed on account of sympathetic ophthalmia.

VII. *Dr Warburton Begbie* then read his paper ON THE THERAPEUTIC ACTIONS AND USES OF TURPENTINE, which appears at p. 39 of our present Number.

Professor Lister remarked that some of the cases narrated possessed very great surgical interest, and were strikingly illustrative of the formidable results which frequently proceeded from the long-continued operation of trifling sources of irritation. This was specially remarkable in the case of foreign bodies in the air-passages, the symptoms of which, after the primary irritation had ceased, were at first of comparatively little consequence apparently, yet ere long severe cough set in, which ended in serious disorganization. A date-stone got stuck in the trachea of a child, where for a long period it produced no very important symptoms, yet the child ultimately died with its lung in a state of putrid disorganization. Again, a young lady, having an ear of grass in her mouth, accidentally drew it into her lungs; for some time she felt no inconvenience, but ultimately her cough became so severe, and her purulent expectoration so copious, that she was looked upon as dying of consumption, and her story of having inhaled an ear of grass was scouted as a pure imagination. At length, however, she expectorated this ear of grass, and completely recovered.

Dr Bennett remarked that, from the opinions of former writers, turpentine was alleged to be a valuable remedy, and useful in a vast variety of diseases, from fever to epilepsy, from mania to iritis, and from pneumonia to foreign bodies in the lungs. It was difficult to see what influence turpentine had over the latter class of cases. Such an extensive employment of this substance in diseases, varying so much in their character, was fitted to excite our distrust in it, and to raise a doubt how far it does relieve many of them. Copland was well known to have had unlimited faith in this drug, and he (Dr B.) had seen it employed on his recommendation in a case of chronic bronchitis affecting the larger tubes, but without the slightest benefit. Notwithstanding the many authorities quoted, from Hippocrates down to Graves and Cheyne, he failed to recognise in the paper any new facts or arguments that demonstrated more than was generally known as to the therapeutic properties of turpentine.

Dr Fraser said that this interesting paper had its interest increased by the reasons so ably adduced in opposition to the views contained in it. Though able, the reasons were not convincing; the varied character of the diseases in which turpentine was useful was no true argument against its utility. Its therapeutical value depended on its physiological action, and that was beneficial in counteracting various morbid phenomena which had a similar pathological substratum. Turpentine was believed by the modern school of therapeutics, by Gubler and others, to possess the power of producing contraction of the minute bloodvessels; this has not indeed been demonstrated, but its therapeutic action, in checking profuse mucous discharges and passive hæmorrhages, made it extremely probable.

Dr Smart said that he had for some time under his observation a man of middle age labouring under pulmonary abscess with very fetid discharge, and in this case repeated inhalations of turpentine had caused the disagreeable odour completely to disappear in twenty-four hours; while the patient was now sleeping better without narcotics than he did with their aid, previous to commencing these inhalations. In another case, he had also seen great relief to chronic laryngitis from the same remedy.

Dr Grainger Stewart said that he had listened with great pleasure to this valuable paper. He had found turpentine invariably of great service in intermittent hæmaturia, in doses of twenty drops every hour or two. In chronic bronchitis he had also found turpentine inhalation of great service, and the results were frequently most happy; but in ordinary fetid bronchitis, and in the fetid expectoration of bronchiectasis, he had found creosote inhalations of most benefit. He would be glad to know from Dr Begbie in what forms of kidney disease the violaceous odour from turpentine was found to be absent—in diseases of the vessels or the tubules?

Dr Joseph Bell said, at least ten years ago, Mr Benjamin Bell had told him of the efficacy of turpentine given internally in checking hæmorrhage from gums, nostrils, etc., in those cases known as hæmorrhagic diathesis, in whom the blood appears to be deficient in coagulating power, and that since then he had invariably used it in such cases with good effect. He believed that such results were so far confirmatory of the theory advanced by Dr Fraser and others, that turpentine acts by its contractile effect on the lesser bloodvessels.

Professor Lister stated that in a case of obstinate hæmorrhage from the prostatic part of the urethra, he could not doubt the efficacy of turpentine.

Dr Bennett said that the mere cessation of hæmorrhage was no proof of the action of the remedy. You gave a patient five grains of sugar of lead, of tannic or of gallic acid, and what was absorbed mixed itself with the 25 or 30 lbs. of blood circulating in the vessels. Did it act on the ruptured vessel as a styptic? if so, it could only reach it in a state of infinitesimal dilution. Or was it supposed that this dilution contracted the vessels? if so, it had never been demonstrated; and what was the value of the assumption? It was not by wild speculation or mere opinion, but by exact research, that modern therapeutics were to be advanced.

Dr Fraser stated that the theoretical objection, that minute doses were incapable of producing the styptic action referred to, was completely overthrown by the actual results of the administration of small doses of ergotin, of bromide of potassium, and of atropia, all of which produced contraction of the small arteries throughout the whole system. There was nothing easier than to ascertain the truth of this statement; because we could not only ascertain the tension of the bloodvessels by means of the sphygmograph, but we could determine the exact changes in blood-pressure by experiments on animals with the kymograph, and even inspect ocularly the small arteries in the transparent parts of animals, as in the webs of frogs and the mesenteries of the higher animals, where they could not only be seen, but measured, as had been done by Stricker, Burdon Sanderson, and many others. It was quite unnecessary to suppose that contraction of the bloodvessels can be produced only by the direct contact of the substance, as changes in the calibre of these vessels can be induced through the nervous system, and, therefore, by an influence exerted by the substance on the vascular nerve-centres.

Dr Bennett—But Dr Fraser had admitted that the theory of Gubler, as to turpentine, had *not* been demonstrated. Now, if the fact was so easy to ascertain as was alleged, would it not be better for therapeutists to experiment for it, and theorize afterwards?

Dr Joseph Bell stated that the special characteristic of the hæmorrhages to which he referred was that they did *not* tend to stop, but to go on indefinitely till the patient became excessively anæmic, and in some cases till the patient died. He referred to the monograph of Dr Wachsmuth[1] on the subject.

Dr Begbie congratulated himself on the conclusive manner in which the opinions he had advanced had been borne out by the experience of the Society, and he felt indebted to those who had added to the interest of his paper by supplementing it with so many interesting facts.

VIII. *Dr Begbie* then read A CASE OF INTESTINAL OBSTRUCTION from a knot on the lower part of the ilium, communicated by Dr Michael W. Taylor of Penrith, which will appear in our next number. This case was illustrated by a remarkably beautiful cast of the parts, made by Dr Taylor himself, which excited much admiration.

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[1] Die Bluterkrankheit. Carl Wachsmuth. Magdeburg, 1849.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXX.—MEETING X.

Wednesday, 12*th April* 1871.—Dr BELL, *President*, in the Chair.

A. C. Johnston, M.R.C.S.E., Lochgoilhead, and Robert Lucas, M.D., Dalkeith, were admitted as Ordinary Fellows of the Society.

I. *Dr Bruce* exhibited a FŒTUS WHICH HAD BEEN EXPELLED WITH THE MEMBRANES ENTIRE. It was about the seventh month, and had been dead for some time.

II. *Mr Stevenson Smith* exhibited a SIMILAR SPECIMEN. The fœtus was about the sixth month, and was expelled with the membranes unruptured after one true pain. He had attended the lady in two previous confinements. In the first, the baby was born in a very weak state, but is now a strong healthy boy; and in the second, the child was expelled stillborn at the eighth month.

III. He also showed the MEMBRANES, etc., OF A FŒTUS, between the second and third month, which had given rise to much hæmorrhage, endangering the life of the mother. On examination, a clot about the size of a small marble was found, and this effusion had evidently induced the premature expulsion of the ovum.

IV. *Dr Keiller* exhibited a GUTTA-PERCHA PESSARY, removed from a patient who had retained it in the vagina for five years. The patient had a fibroid tumour complicated with hernia. She had worn the pessary all that time without having any pain, fœtor, or discharge.

Dr Gordon remarked that pessaries of gutta-percha might be left in any length of time without giving rise to any unpleasant symptoms.

Dr Cochrane said he had met with one case in which a pessary had been retained for several years.

V. *Dr Pattison* made some observations on TWO INTERESTING CASES which had occurred recently in his practice.

Drs Keiller, *Jefferiss*, and *Mr Stevenson Smith*, made some remarks.

VI. A CASE OF SPONTANEOUS VERSION. BY DR STANLEY HAYNES, HELMSLEY. COMMUNICATED BY MR G. STEVENSON SMITH.

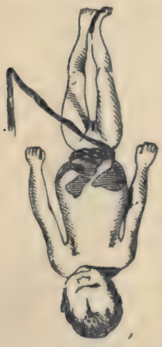
At 4.30 P.M. to-day, I attended Mrs M., aged thirty-seven, and found she was in labour; that the os uteri was dilated to the extent of two inches in diameter, and its edge was thick and soft; that the membranes protruded as a fluctuating rounded tumour; that the head presented in the left occipito-anterior position, and was at the pelvic brim; that the bladder and rectum were empty, and that all the parts were in a favourable condition. The patient believed that the membranes had ruptured the previous day, but she had not had any labour-pains until noon to-day; she now felt the pains in her back much more than in front. The pains recurred every three minutes, were moderately strong, and were dilating the os. The patient wishing to use a night-stool, I went into the next room, whence I was called in haste in a few minutes (at 5.15), and found her just flinging herself on to the bed, and requesting my assistance. It appeared that while on the stool she had felt a sudden and great movement within, and directly afterwards a conviction that the birth would be immediate. The breech and right foot now presented, the back of the child being towards the left foramen ovale. During the next pain, the presenting parts and the body up to the funis were expelled, and the left thigh and leg were found to be opposed to the trunk of the child. As the cord pulsated well, the next pain was waited for and quickly came, causing the birth in succession of the left foot, right arm and left arm. Another pain completed the delivery of a moderate-sized, vigorous male child. The placenta came away twenty minutes later (at 5.40).

The mother stated she had had seven children without any unusual occurrence, and that all had presented by the head. During the past week she suffered much from vomiting, which was arrested by the third dose of bismuth and hydrocyanic acid mixture.

VII. A CASE OF DEATH OF FŒTUS FROM COILING OF THE FUNIS.

BY DR ALEXANDER MILNE. COMMUNICATED BY MR THOMSON.

Mrs M., a healthy and strong woman, was confined of her first child on the 14th of March last. Labour proceeded naturally, but on making an examination to ascertain progress, I thought the scalp somewhat flabby, and the cranial bones overlapping rather freely. When the head was born, I noticed the lips not simply cyanotic, but black, and there was no movement of any kind,—in short, the child was dead. When the trunk was expelled, the cause of death became quite clear. The funis was coiled thrice round the abdomen, in the manner shown in the drawing. The abdomen, it will be observed, is considerably constricted, but not sufficient to constitute this into one of the causes of death. The vessels of the funis are not abnormally twisted; the spirality does not exceed that which is usually found. The cause of death was indubitably owing to the extreme stretching of that part of the cord close to the umbilicus. This part was so tight that the finger could with difficulty be inserted below it. The drawing shows this pretty well; the umbilicus is seen to be drawn out, and quite obliterated by the strength of the traction. Large patches of cuticle are seen to have been peeled from the abdomen and other parts.



The mother says that the child was always exceedingly lively, and that often during the night its movements broke her slumber. About twelve days before labour set in there was an "unusual struggling in her belly," but after this all movement ceased, and she apprehended that all was not well with it. This violent commotion, I presume we may conclude, was owing to the interruption to the circulation in the funis.

The child was well developed, and bore no traces of disease, therefore there can be no doubt but that its death was owing to arrestment of the circulation. Coiling, we all know, is a common occurrence, and perfectly compatible with fœtal safety. It is only when overstretching, and consequent strangulation, takes place, that embryonic life is compromised.

Dr Pattison said it was singular to see the cord twisted round the abdomen.

Dr Frazer made some remarks on the distinction between asphyxia and apnœa.

SESSION XXX.—MEETING XI.

Wednesday, 26th April 1871.—Dr KEILLER in the Chair.

I. *Dr Keiller* exhibited A PLACENTA from a case of placenta prævia, in which he had delivered by turning. When called to the case the patient was much exhausted from loss of blood, and the vagina was almost filled with a clot. The placenta was not entirely over the os, and the membranes were unruptured. The afterbirth came away almost immediately after extraction of the child. This was a case where delay would have proved dangerous. He recollected at least three cases of death after version through interference being too long delayed.

II. Case of RUPTURE OF FALLOPIAN TUBE, AND DEATH FROM HÆMORRHAGE. By Dr Heigham. Communicated by Dr Keiller.

III. NOTES OF A REMARKABLE CASE OF EARLY PREGNANCY.

Dr James Young mentioned the following case of early pregnancy. Mrs A. B. was born on the 11th of October 1855, and menstruated on the 11th of May 1869, at the age of thirteen years and seven months. Sexual intercourse took place on the 20th of November 1869, and she was married in March 1870—after the discovery of pregnancy, which must have commenced at the age of *fourteen years* and one month. A large male child was born on the 24th of August 1870, at the age of *fourteen years* and *ten* months. The labour was very protracted (fourteen hours) and difficult, a large caput succedaneum having formed on the head. The mother made a good recovery, but suffered severely from suppuration of one mamma, with partial sloughing. Dr Young said he had met with very many cases of early menstruation, but he never met with a case of pregnancy, nor ever heard of one in this country, at such an early age as fourteen years and ten months, where the uterus threw off a large healthy male child.

Dr Duncan said he remembered attending a young lady a long time ago in her first confinement, who was said to be under fifteen, —the father of the child being sixteen years of age.

Dr Keiller had seen a number of cases of early pregnancy, but the real age was often concealed. He remembered one patient who was confined in the Maternity at the age of fifteen. She was well formed, and had an easy labour.

Dr Cuthbert attended a case where the mother's age was between fifteen and sixteen, and she had been skipping the rope just the day before.

IV. NOTES OF A CASE OF AN ANENCEPHALOUS FŒTUS.

BY DR FRAZER.

On the 23d February 1860, I was called to a married woman aged 30, pregnant for the first time. I found her in the middle of the first stage of labour. I could not diagnose the presentation, being in doubt whether it was the breech or the shoulder which presented. However, as the labour advanced, the part came down more and more, and there was no doubt of its being the shoulder. I then resolved to turn the child. To aid in accomplishing this it was found necessary to put the patient very deeply under the influence of chloroform, because the uterine contractions were very strong. After the feet were brought down, the expulsion of the child was effected in two or three minutes, with very little help from me. The fœtus proved to be anencephalous, but apparently well developed in other respects. It now forms part of the collection of Dr Matthews Duncan of this city. It was quite dead when it was born, but had evidently been alive not long before. I may mention that the woman, by her own account, had exceeded the usual period of nine months by two or three weeks. She made a good recovery. I believe the case in itself is not very extraordinary. I mention it to the Society in the hope of bringing out information regarding the diagnosis and treatment of such cases. I should feel obliged to the chairman, Dr Keiller, and to the members generally, for their opinion respecting the propriety of turning in the case just mentioned. I should like to know whether they believe that nature would have been able to effect the expulsion of the fœtus shoulder downwards, and if she could, whether the result was likely to have been as favourable to the mother as that from the practice which I adopted.

Dr Duncan said he recollected the case, but he had seen nothing of the labour. He did not wonder at any one being puzzled with such a case, but he was of opinion that an anencephalous child might be born in any way. If the shoulder came down and there was not sufficient room to let the fœtus pass in that way, there could be no harm in turning.

Dr Keiller remarked that the diagnosis of such cases was often difficult. They were not at all uncommon. He had about a dozen specimens in his museum. In one case which occurred in the Maternity a while ago, the child lived for some time.

Dr Bruce thought the diagnosis of such cases was always a little difficult, especially till the presenting part came well down.

Dr Ritchie believed that in such cases the child was retained longer *in utero* than usual, and that the second stage of labour was apt to be protracted.

Professor Simpson said that in some such cases the fœtus was not at all well developed, especially when a cleft in the spine existed. The diagnosis was usually rendered easier by combined external and internal examination.

Dr Young said he had related the particulars of a case of this kind to the Society some years ago. The mother had previously given birth to two children, and since then she had had two stillborn children.

SESSION XXX.—MEETING XII.

Wednesday, 10*th May* 1871.—Dr KEILLER in the Chair.

I. CASE OF FIBROID POLYPUS OF THE UTERUS, WITH PREPARATION. BY DR THOMAS OF YSTALYFERA. COMMUNICATED BY PROFESSOR SIMPSON.

Maria E., æt. forty years, tall and of light complexion; married eleven years; has had four children; two died young, but the two living ones are healthy, the younger now six years of age.

There is nothing striking in her antecedent history. Her father died about six years since from heart disease; mother is still alive, and has always enjoyed good health, with the exception of being occasionally troubled with rheumatism. Has four sisters and three brothers, all healthy.

24*th April* 1869.—I was asked to see her in consequence of an alarming attack of flooding, which had come on suddenly whilst washing the floor. She stated that she lost some blood about a fortnight before, and even on four previous occasions, but never considered it bad enough to seek advice. She has never had a miscarriage, and has always menstruated regularly up to about three months back, when the irregularity as to time commenced, and the flow to increase in quantity. On my first visit I made no vaginal examination, simply ordering complete rest, gallic acid with brandy according to circumstances, etc.

The following day (25th), she was much better, having rallied considerably.

26*th*.—Not so well, with a recurrence of the bleeding. On my proposing an examination, she told me that about three months back she perceived a "hard lump in the bottom of her belly," and on placing my hand on her abdomen, I could feel distinctly a hard smooth resisting body, emerging considerably above the pubes, with another a little nearer the umbilicus, and rather to the left side, but of a much smaller size, and evidently more superficial than the lower one. This tumour grows evidently from the thickness of the uterine wall, projecting upwards in the left hypogastric region.

In making a vaginal examination, I felt an oval body protruding through the os. It was hard, smooth, and attached pretty high up to the posterior part of the cervix uteri. By manipulating with one hand in the vagina and the other on the abdomen, one could form a fair idea of its oval size. The patient lost this time a great quantity of blood, and I was afraid she would not rally; however, she improved gradually, and by the 28th reaction had fairly set in.

Owing to its large size and its extensive attachments, I told the friends that I was of opinion that any interference with the view of its removal would be too hazardous in her present prostrated, state. She continued to improve, and after about six weeks' attendance I quite lost sight of her, until 15*th December* 1870 (nearly twenty-one months since the date of my first attendance, and about two years since she had first noticed any enlargement), when I was again requested to see her. She was now in great pain, and, on examination, I found the tumour filling up the vagina, with its apex all but projecting beyond the valvular aperture; and owing to the pressure signs, which rendered defecation difficult and micturition impossible, I had no other alternative but to recommend a speedy removal.

Mr John R. James, surgeon, administered chloroform, and without much difficulty I managed to get the chain of the ecraseur round the pedicle, which was very tense, and about the size of an ordinary female's wrist.

After tightening the chain to an extent short of cutting into the texture of the pedicle, we found it failed to make any further impression upon it. We could by main force work the handle up and down, but the spring would not catch—something very much after the fashion of a screw that has been over-tightened, so that the thread gives.

The ecraseur, after a fruitless trial of nearly an hour, had to be abandoned, and next I tried to tear it through by means of a strong whip-cord, which, like the ecraseur, only proved useless. Lastly, I tied a piece of strong cord as tightly as I could and as high round the pedicle as I could reach, and below this managed with some little difficulty to cut through it with a small scalpel, and without any loss of blood. The ligature came away on the third day in some Condy's fluid, with which I cleansed the parts for four days after the operation.

The tumour, shortly after removal, weighed all but two pounds, and resembled very much in size, shape, and appearance a bullock's heart. The woman made a very rapid recovery, and in a fortnight was about the house attending to her usual duties.

Two months after the operation, I again examined the patient, and especially the uterus, but could detect nothing abnormal, beyond a small parietal tumour, situated in the fundus uteri, and rather to the left side.

Dr Simpson showed the tumour, which on section was seen to be a beautiful specimen of uterine myoma or fibroid tumour of the uterus that had originally been intramural, and, under the muscular contractions of the walls, has been partially expelled. The mucous membrane was thick and vascular, and contrasted with the paler glistening fibroid structure of the interior of the mass.

Dr Keiller remarked that the cut surface of the polypus resembled mahogany. He was inclined to think that the author was a little too timid as to cutting, after compression had been made by the ecraseur. He had frequently in his own practice snipped across the pedicle with scissors or a bistoury, after it had been well crushed, and almost no hæmorrhage followed. He had exhibited to the Society some years ago a large polypus which he had removed, about the size of the fist, and in that case he cut through the pedicle after compression with the ecraseur. He had in his museum another preparation showing a polypus just coming through the cervix. An attempt had been made to remove it, but without success.

Dr Gordon remarked that in such cases the blood usually came from the uterus, and not from the tumour. He had seen the late Sir James Simpson cut very largely into such tumours without causing much bleeding.

II. ON THE MODE OF INTRODUCING THE MIDWIFERY FORCEPS, AND

III. NOTE ON MODIFICATION OF MIDWIFERY FORCEPS.

BY DR CAPPIE.

(This paper will appear in a future Number of the Journal.)

Professor Simpson said he had been in the habit of using the right hand as a guide in introducing the forceps, but not in the way described by Dr Cappie. He thought it a good plan to direct the point of the blade more towards the hollow of the sacrum than was usually done. It was a matter of indifference how the patient was placed, if chloroform is used. Sometimes with the patient on the back, the operator can exert more purchase and power.

Dr Gordon thought that it was an excellent plan to pass the blade on with the forefinger inside the fenestrum.

Dr Bruce said he was in the habit of keeping the patient in the ordinary position. He used the left hand to hold the instrument, but twisted the wrist forwards. He found it a good plan, in introducing the first blade, to push it well downwards and backwards.

Sometimes with the patient lying on her back more power could be used.

Dr Duncan said he never found any difficulty in applying the instruments. They might be applied in almost any way, but the difficulty usually came after. It would not do in all cases to apply the blades along the curve of the sacrum. He thought that in all cases the pelvis of the patient ought to be close to the edge of the bed. It was no doubt desirable that the operation should be made as little formidable as possible, but the patient should be placed in the best possible position.

Dr Keiller said that his views corresponded with those of Dr Duncan. He was of opinion that it would not do to teach young and inexperienced practitioners that Dr Cappie's mode of introducing the forceps was the proper one. He always liked to have the patient placed well across the bed, and it is often necessary to use more than the forefinger to ascertain with certainty where the point of the blade is going. When there is much doubt or difficulty, he advises his students to introduce the whole hand into the passages. It has been suggested that the handles of the instrument might be turned backwards, so as to make the operator independent of the position of the patient. He often thought that instruments might be made without handles, their place being supplied by the fingers.

Dr Young agreed with Dr Keiller as to the propriety of introducing the whole hand in cases of doubt.

Dr Cappie made a few remarks in reply, and stated that he had once used his forceps without the patient or the attendant knowing anything about it.

Part Fourth.

PERISCOPE.

A Graduation Address of great interest was delivered last March by Dr Oliver Wendell Holmes of Harvard University. From it we take the following extracts:—

I speak more directly to you, then, gentlemen of the graduating class. The days of your education, as pupils of trained instructors, are over. Your first harvest is all garnered. Henceforth you are to be sowers as well as reapers, and your field is the world. How does your knowledge stand to-day? What have you gained as a permanent possession? What must you expect to forget? What remains for you yet to learn? These are questions which it may interest you to consider.

There is another question which must force itself on the thoughts of many among you: "How am I to obtain patients and to keep their confidence?" You have chosen a laborious calling, and made many sacrifices to fit yourselves for its successful pursuit. You wish to be employed that you may be useful, and that you may receive the reward of your industry. I would take advantage of these most receptive moments to give you some hints which may help you to realize your hopes and expectations. Such is the outline of the familiar talk I shall offer you.

Your acquaintance with some of the accessory branches is probably greater now than it will be in a year from now—much greater than it will be ten years from now. The progress of knowledge, it may be feared, or hoped, will have outrun the text-books in which you studied these branches. Chemistry, for instance, is very apt to spoil on one's hands. "*Nous avons changé tout cela*" might serve as the standing motto of many of our manuals. Science is a great traveller, and wears her shoes out pretty fast, as might be expected.

You are now fresh from the lecture-room and the laboratory. You can pass an examination in anatomy, physiology, chemistry, materia medica, which the men in large practice all around you would find a more potent sudorific than any in the Pharmacopœia. These masters of the art of healing were once as ready with their answers as you are now, but they have got rid of a great deal of the less immediately practical part of their acquisitions, and you must undergo the same depleting process. Hard work will train it off, as sharp exercise trains off the fat of a prize-fighter.

Yet, pause a moment before you infer that your teachers must have been in fault when they furnished you with mental stores not directly convertible to practical purposes, and likely in a few years to lose their place in your memory. All systematic knowledge involves much that is not practical, yet it is the only kind of knowwhich satisfies the mind, and systematic study proves in the long-run the easiest way of acquiring and retaining facts which are practical. There are many things which we can afford to forget, which yet it was well to learn. Your mental condition is not the same as if you had never known what you now try in vain to recall. There is a perpetual metempsychosis of thought, and the knowledge of to-day finds a soil in the forgotten facts of yesterday. You cannot see anything in the new season of the guano you placed last year about the roots of your climbing plants, but it is blushing and breathing fragrance in your trellised roses; it has scaled your porch in the bee-haunted honeysuckle; it has found its way where the ivy is green; it is gone where the woodbine expands its luxuriant foliage.

Your diploma seems very broad to-day with your list of accomplishments, but it begins to shrink from this hour like the *Peau de Chagrin* of Balzac's story. Do not worry about it, for all the while there will be making out for you an ampler and fairer parchment, signed by old Father Time himself as President of that great University in which experience is the one perpetual and all-sufficient professor.

Your present plethora of acquirements will soon cure itself. Knowledge that is not wanted dies out like the eyes of the fishes of the Mammoth Cave. When you come to handle life and death as your daily business, your memory will of itself bid good-bye to such inmates as the well-known foramina of the sphenoid bone and the familiar oxides of methyl-ethyl-amyl-phenyl-ammonium. Be thankful that you have once known them, and remember that even the learned ignorance of a nomenclature is something to have mastered, and may furnish pegs to hang facts upon which would otherwise have strewed the floor of memory in loose disorder. . . .

It must be confessed that the great hospitals, infirmaries, and dispensaries of large cities, where men of well-sifted reputations are in constant attendance, are the true centres of medical education. No students, I believe, are more thoroughly aware of this than those who have graduated at this institution. Here, as in all our larger city schools, the greatest pains are taken to teach things as well as names. You have entered into the inheritance of a vast amount of transmitted skill and wisdom, which you have taken, warm, as it were, with the life of your well-schooled instructors. You have not learned all that art has to teach you, but you are safer practitioners to-day than were many of those whose names we hardly mention without a genuflection. I had rather be cared for in a fever by the best-taught among you than by the renowned Fernelius or the illustrious Boerhaave, could they come back to us from that better world where there are no physicians needed, and, if the old adage can be trusted, not many within call. I had rather have one of you exercise his surgical skill upon me than find myself in the hands of a resuscitated Fabricius Hildanus, or even of a wise Ambroise Paré, revisiting earth in the light of the nineteenth century.

You will not accuse me of underrating your accomplishments. You know what to do for a child in a fit, for an alderman in an apoplexy, for a girl that has fainted, for a woman in hysterics, for a leg that is broken, for an arm that is out of joint, for fevers of every colour, for the sailor's rheumatism, and the tailor's cachexy. In fact, you do really know so much at this very hour, that nothing but the searching test of time can fully teach you the limitations of your knowledge.

Of some of these you will permit me to remind you. You will never have outgrown the possibility of new acquisitions, for Nature is endless in her variety. But even the knowledge which you may be said to possess will be a different thing after long habit has made it a part of your existence. The *tactus eruditus* extends to the mind as well as to the finger-ends. Experience means the knowledge gained by habitual trial, and an expert is one who has been in the habit of trying. This is the kind of knowledge that made Ulysses wise in the ways of men. Many cities had he seen, and known the minds of those who dwelt in them. This knowledge it was that Chaucer's Shipman brought home with him from the sea:

> "In many a tempest had his berd be shake."

This is the knowledge we place most confidence in, in the practical affairs of life. . . .

Book-knowledge, lecture-knowledge, examination-knowledge, are all in the brain. But work-knowledge is not only in the brain, it is in the senses, in the muscles, in the ganglia of the sympathetic nerves—all over the man, as one may say, as instinct seems diffused through every part of those lower animals that have no such distinct organ as a brain. See a skilful surgeon handle a broken limb; see a wise old physician smile away a case that looks to a novice as if the sexton would soon be sent for; mark what a large experience has done for those who were fitted to profit by it, and you will feel convinced that, much as you know, something is still left for you to learn.

May I venture to contrast youth and experience in medical practice, something in the way the man painted the lion—that is, the lion under?

The young man knows the rules, but the old man knows the exceptions. The young man knows his patient, but the old man knows also his patient's family, dead and alive, up and down for generations. He can tell beforehand what diseases their unborn children will be subject to, what they will die of if they live long enough, and whether they had better live at all, or remain unrealized possibilities, as belonging to a stock not worth being perpetuated. The young man feels uneasy if he is not continually doing something to stir up his patient's internal arrangements. The old man takes things more quietly, and is much more willing to let well enough alone. All these superiorities, if such they are, you must wait for time to bring you. In the meanwhile (if we will let the lion be uppermost for a moment), the young man's senses are quicker than those of his older rival. His education in all the accessory branches is more recent, and therefore nearer the existing condition of knowledge. He finds it easier than his seniors to accept the improvements which every year is bringing forward. New ideas build their nests in young men's brains. "Revolutions are not made by men in spectacles," as I once heard it remarked, and the first whispers of a new truth are not caught by those who begin to feel the need of an ear-trumpet. Granting all these advantages to the young man, he ought, nevertheless, to go on improving, on the whole, as a medical practitioner, with every year, until he has ripened into a well-mellowed maturity. But, to improve, he must be good for something at the start. If you ship a poor cask of wine to India and back, if you keep it half a century, it only grows thinner and sharper.

You are soon to enter into relations with the public, to expend your skill and knowledge for its benefit, and find your support in the rewards of your labour. What kind of a constituency is this which is to look to you as its authorized champions in the struggle of life against its numerous enemies?

In the first place, the persons who seek the aid of the physician are very honest and sincere in their wish to get rid of their complaints, and, generally speaking, to live as long as they can. However attractively the future is painted to them, they are attached to the planet with which they are already acquainted. They are addicted to the daily use of this empirical and unchemical mixture which we call air, and would hold on to it as a tippler does to his alcoholic drinks. There is nothing men will not do, there is nothing they have not done, to recover their health and save their lives. They have submitted to be half-drowned in water, and half-choked with gases, to be buried up to their chins in earth, to be seared with hot irons like galley-slaves, to be crimped with knives, like cod-fish, to have needles thrust into their flesh, and bonfires kindled on their skin, to swallow all sorts of abominations, and to pay for all this, as if to be singed and scalded were a costly privilege, as if blisters were a blessing, and leeches were a luxury. What more can be asked to prove their honesty and sincerity?

This same community is very intelligent with respect to a great many subjects—commerce, mechanics, manufactures, politics. But with regard to medicine it is hopelessly ignorant and never finds it out. I do not know that it is any worse in this country than in Great Britain, where Mr Huxley speaks very freely of "the utter ignorance of the simplest laws of their own animal life, which prevails among even the most highly-educated persons." And Cullen said before him: "Neither the acutest genius nor the soundest judgment will avail in judging of a particular science, in regard to which they have not been exercised. I have been obliged to please my patients sometimes with reasons, and I have found that any will pass, even with able divines and acute lawyers; the same will pass with the husbands as with the wives." If the community could only be made aware of its own utter ignorance, and incompetence to form opinions on medical subjects, difficult enough to those who give their lives to the study of them, the practitioner would have an easier task. But it will form opinions of its own, it cannot help it, and we cannot blame it, even though we know how slight and deceptive are their foundations. . . .

Experience has taught, or will teach you, that all the wonderful stories patients and others tell of sudden and signal cures are like Owen Glendower's story of the portents that announced his birth. The earth shook at your nativity, did it? Very likely, and—

> "So it would have done,
> At the same season, if your mother's cat
> Had kittened, though yourself had ne'er been born."

You must listen more meekly than Hotspur did to the babbling

Welshman, for ignorance is a solemn and sacred fact, and, like infancy, which it resembles, should be respected. Once in a while you will have a patient of sense, born with the gift of observation, from whom you may learn something. When you find yourself in the presence of one who is fertile of medical opinions, and affluent in stories of marvellous cures—of a member of Congress whose name figures in certificates to the value of patent medicines, of a voluble dame who discourses on the miracles she has wrought or seen wrought with the little jokers of the sugar-of-milk globule-box,—take out your watch and count the pulse; also note the time of day, and charge the price of a visit for every extra fifteen, or, if you are not very busy, every twenty minutes. In this way you will turn what seems a serious dispensation into a double blessing, for this class of patients loves dearly to talk, and it does them a deal of good, and you feel as if you had earned your money by the dose you have taken, quite as honestly as by any dose you may have ordered.

You must take the community just as it is, and make the best of it. You wish to obtain its confidence; there is a short rule for doing this which you will find useful—*deserve it.* But, to deserve it in full measure, you must unite many excellences, natural and acquired.

As the basis of all the rest, you must have all those traits of character which fit you to enter into the most intimate and confidential relations with the families of which you are the privileged friend and counsellor. Medical Christianity, if I may use such a term, is of very early date. By the oath of Hippocrates, the practitioner of ancient times bound himself to enter his patient's house with the sole purpose of doing him good, and so to conduct himself as to avoid the very appearance of evil. Let the physician of to-day begin by coming up to this standard, and add to it all the more recently discovered virtues and graces. . . .

I warn you against all ambitious aspirations outside of your profession. Medicine is the most difficult of sciences and the most laborious of arts. It will task all your powers of body and mind if you are faithful to it. Do not dabble in the muddy sewer of politics, nor linger by the enchanted streams of literature, nor dig in far-off fields for the hidden waters of alien sciences. The great practitioners are generally those who concentrate all their powers on their business. If there are here and there brilliant exceptions, it is only in virtue of extraordinary gifts, and industry to which very few are equal.

To get business a man must really want it, and do you suppose that when you are in the middle of a heated caucus, or half-way through a delicate analysis, or in the spasm of an unfinished ode, your eyes rolling in the fine frenzy of poetical composition, you want to be called to a teething infant, or an ancient person groaning under the griefs of a lumbago? . . .

What shall I say of the personal habits you must form if you wish for success? Temperance is first upon the list. Intemperance in a physician partakes of the guilt of homicide, for the muddled brain may easily make a fatal blunder in a prescription, and the unsteady hand transfix an artery in an operation. Tippling doctors have been too common in the history of medicine. Paracelsus was a sot, Radcliffe was much too fond of his glass, and Dr James Hurlbut, of Wethersfield, Connecticut, a famous man in his time, used to drink a square bottle of rum a day, with a corresponding allowance of opium to help to steady his nerves. We commonly speak of a man as being the worse for liquor, but I was asking an Irish labourer one day about his doctor, who, as he said, was somewhat given to drink. "I like him best when he's a little that way," he said—"then I can spake to him." I pitied the poor patient who could not venture to allude to his colic or his pleurisy until his physician was tipsy.

There are personal habits of less gravity than the one I have mentioned which it is well to guard against, or, if they are formed, to relinquish. A man who may be called at a moment's warning into the fragrant boudoir of suffering loveliness, should not unsweeten its atmosphere with reminiscences of extinguished meerschaums. He should remember that the sick are sensitive and fastidious, that they love the sweet odours and the pure tints of flowers, and if his presence is not like the breath of the rose, if his hands are not like the leaf of the lily, his visit may be unwelcome, and if he looks behind him he may see a window thrown open after he has left the sick-chamber. . . .

Need I remind you of the importance of punctuality in your engagements, and of the worry and distress to patients and their friends which the want of it occasions? One of my old teachers always carried two watches, to make quite sure of being exact, and not only kept his appointments with the regularity of a chronometer, but took great pains to be at his patient's house at the time when he had reason to believe he was expected, even if no express appointment was made. It is a good rule; if you call too early, my lady's hair may not be as smooth as could be wished, and if you keep her waiting too long, her hair may be smooth, but her temper otherwise.

You will remember, of course, always to get the weather-gage of your patient. I mean, to place him so that the light falls on his face and not on yours. It is a kind of ocular duel that is about to take place between you; you are going to look though his features into his pulmonary and hepatic and other internal machinery, and he is going to look into yours quite as sharply to see what you think about his probabilities for time or eternity. . . .

Your patient has no more right to all the truth you know than he has to all the medicine in your saddle-bags, if you carry that kind of cartridge-box for the ammunition that slays disease. He should get only just so much as is good for him. I have seen a physician examining a patient's chest stop all at once, as he brought out a particular sound with a tap on the collar-bone, in the attitude of a pointer who has just come on the scent or sight of a woodcock. You remember the Spartan boy, who, with unmoved countenance, hid the fox that was tearing his vitals beneath his mantle. What he could do in his own suffering you must learn to do for others on whose vital organs disease has fastened its devouring teeth. It is a terrible thing to take away hope, even earthly hope, from a fellow-creature. . . .

Some shrewd old doctors have a few phrases always on hand for patients that will insist on knowing the pathology of their complaints without the slightest capacity of understanding the scientific explanation. I have known the term "spinal irritation" serve well on such occasions; but I think nothing on the whole has covered so much ground, and meant so little, and given such profound satisfaction to all parties, as the magnificent phrase "congestion of the portal system." . . .

If there happened to be among my audience any person who wished to know on what principles the patient should choose his physician, I should give him these few precepts to think over:—

Choose a man who is personally agreeable; for a daily visit from an intelligent,[1] amiable, pleasant, sympathetic person will cost you no more than one from a sloven or a boor, and his presence will do more for you than any prescription the other will order.

Let him be a man of recognised good sense in other matters, and the chance is that he will be sensible as a practitioner.

Let him be a man who stands well with his professional brethren, whom they approve as honest, able, courteous.

Let him be one whose patients are willing to die in his hands, not one whom they go to for trifles and leave as soon as they are in danger, and who can say, therefore, that he never loses a patient.

Do not leave the ranks of what is called the regular profession, unless you wish to go farther and fare worse, for you may be assured that its members recognise no principle which hinders their accepting any remedial agent proved to be useful, no matter from what quarter it comes.—*New York Medical Journal*, April 1871.

CHLORAL IN OBSTETRICS.—Dr S. F. Starley of Fairfield, Texas, writes as follows concerning the value of chloral in obstetric practice: —"For nearly twenty years I have used chloroform in parturition; but since the introduction of chloral, I have substituted it for the former in a number of labours, and find it a valuable anæsthetic, and in many respects greatly preferable to chloroform. It is easy of administration, does not require the constant attention of the accoucheur, and produces no sudden or overwhelming effect. I usually commence with twenty grains; in one or two hours, fifteen to twenty grains again, and then often enough to keep up the anæsthetic effect. Quite recently I was called to a lady in her third labour, who, from living in a malarial region and from repeated chills, had well-marked malarial cachexia; and who, just after my entrance into her room, was seized with a violent convulsion, which soon passed off, leaving her in a semi-comatose condition. Thirty grains of chloral were administered as soon as she was able to swallow. Immediately upon sufficient dilatation of the os uteri, the forceps were applied, and she was delivered of a healthy child. She had no more convulsions, and made a good recovery. The favourable result in this case is fairly attributable, I believe, to the early administration of the chloral and the prompt application of the forceps. In another case, where the convulsion occurred just after the birth of the child, thirty grains of chloral were administered; another convulsion, and one-sixth of a grain of morphia was used by hypodermic injection: no more convulsions, and the patient recovered promptly. My experience leads me to believe that puerperal convulsions are of frequent occurrence in malarial regions; probably in consequence of the blood deterioration from the subtle poison of those regions. Now, if chloral is so efficient in *curing* convulsions, might not its timely administration to women in labour prevent their occurrence?"

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[1] "Non quærit æger medicum eloquentem sed sanantem: si tamen ita competit, ut idem ille qui sanare potest, compte de iis quæ facienda sunt disserat, boni consulet."—*Senec. Epist.* 76.—(ED. *E. M. J.*)

The Doctor speaks highly of the value of chloral in producing relaxation in case of rigidity of the os uteri. He believes it contraindicated when there is organic disease of the heart or danger of pulmonary congestion. Finally, he desires to urge upon his professional brethren the importance of the employment of this agent in suitable cases.

While referring to the subject of chloral in obstetrics, we append the following inquiry from Dr Charles B. Tydings, of Big Spring, Ky., and possibly Dr Starley or some other of our contributors will furnish the desired information. Dr T.'s inquiry is, "Does the hypnotic effect of chloral, when administered as an anæsthetic in parturition, extend to the child also?" He then states that in the only case under his observation it was given in fifteen-grain doses every twenty minutes for an hour and twenty minutes. The mother was unconscious at the birth of her child; and both mother and child fell into a profound slumber of eighteen hours' duration. Is it usual for such results to occur?—*American Practitioner.*

NITRO-MURIATIC ACID IN URTICARIA.—A. M. Lyles, M.D., of Early Grove, Mississippi, writes that he has found, for many years past, that ten drops of nitro-muriatic acid, in a wineglassful of water, one hour before eating, is an almost unfailing remedy for urticaria. He has observed that the disease is attended by the generation in the alimentary tube of an excessive amount of acid, which the nitro-muriatic acid, given as above, corrects.—*American Practitioner.*

NOTE ON THE HISTORY OF OVARIOTOMY. BY DR NATTA-SOLERI VINCENZO.

In 1752, the idea of ovariotomy entered the mind of an illustrious Italian, Jean Targioni Tozzetti, of Tuscany, after seeing a case in which the ovary had been successfully removed from a young girl by a man quite ignorant of surgery. He prophesied that ovariotomy would some day take rank as a recognised operation in surgery.

Morgagni next having made the distinction between simple or unilocular cysts and multilocular ones, stated that the first might be removed in cases where adhesions did not exist. It was a great step towards the admission of this operation, to state in 1761 the indications which should contraindicate its performance. Time and experience could do the rest.

Later, Monteggia, fearing the results of the operation which might follow extensive incisions, advised early operation before the cyst had attained a large size or contracted adhesions.

At length, in 1815, a modest surgeon, Emiliani Gaetano de Faenza, a man full of wisdom and daring, attempted the operation on a young woman, aged twenty-six. An otherwise good state of health encouraged the attempt, and the patient consented. He made an incision, eight inches in length, in the linea alba, through the whole thickness of the abdominal wall, down to the peritoneum, which he divided cautiously. The left ovary, much enlarged, then presented itself, and he recognised it adherent to the lower part of the colon. The adhesions being overcome, the tumour was got out of the belly, was removed, the vessels being tied as they were divided, after which the edges of the wound were united by suture, and covered by charpie and a gently retentive bandage. The case recovered; and thus it is not Hizars (Lizars) of Edinburgh who must be considered the first to practise ovariotomy scientifically in Europe, as he did not operate till 1825, or ten years after Dr Emiliani de Faenza. Ovariotomy entered Europe in 1815, through Italy, as can be verified by consulting the Bulletino delle Scienze Mediche de Bologna, where a detailed account of this operation will be found, which deserves a place among the first in the annals of surgery.—*Gazette Médicale de Paris.* No. 124, 1870.

Part Fifth.

MEDICAL NEWS.

Letter from Creuznach.—Dear Sir,—It is said in some English journals, that it is rather dangerous this year to visit Rhenish spas, for epidemic disease is ravaging there. I assure you, Sir, that it is not so. The state of health of our town this year is as good as it ever has been. We have lazarettos here for wounded and sick soldiers. But the barracks have been far off from the bath-hôtels, and in the town we have no epidemics of any kind, nor typhoid fever nor dysentery; only a few cases of smallpox, as almost everywhere. But also this disease has expired completely. I write you this letter in the interest of poor sick people, intending to visit Creuznach, and frightened by the rumour not to do so. You will do me a great service, if you will have the kindness to propagate this declaration, perhaps, by your *Edinburgh Medical Journal*.—Yours truly,

DR ENGELMANN.

HASTINGS PRIZE.—Our readers will be glad to learn that Dr Milner Fothergill, of Leeds, the author of the very interesting paper on *Carbolic Acid from a Septic Point of View*, which appears in our present number, has been awarded the Hastings prize for an essay "On Digitalis—its Mode of Action, and its Use," which is stated by the adjudicators to be possessed of great original merit.

DEATH-RATE AND TEMPERATURE.—The following interesting and valuable document was sent, in February last, to the Secretary of the Scottish Meteorological Society, by a well-known observer, Mr Gibb of Kettins, Forfarshire:—

I send you the list of Burials registered in the parish of Kettins in each month of the year for 31 years from 1686 to 1716; also for 45 years from 1751 to 1795; and for 4 years 1802–1805; and for 28 years from 1828 to 1855—viz., for 108 years; from which may be seen how temperature and climate affect the health and life.

No regular entries had been made during the years left out.

	Years.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Totals.	Means.
1686 to 1716	31	84	67	90	92	82	61	48	53	41	42	65	95	820	26·5
1751 to 1795	45	164	157	142	140	122	107	62	69	80	86	94	131	1354	30·0
1802 to 1805	4	19	13	9	4	10	9	12	7	9	5	6	6	109	27·2
1828 to 1855	28	45	34	51	31	32	23	45	29	21	39	39	42	431	15·5
Totals,	108	312	271	292	267	246	200	167	158	151	172	204	274	2714	25·13
Mean of 108 years,		2·89	2·51	2·70	2·47	2·28	1·85	1·55	1·46	1·40	1·59	1·89	2·54	25·13	2·10
Months reduced to 30 days each		2·81	2·67	2·61	2·47	2·21	1·85	1·50	1·41	1·40	1·54	1·89	2·46	...	2·07
Mean Temp. 13 yrs.		36°·1	38°·1	39°·3	44°·6	49°·4	54°·5	57°·3	56°·5	52°·9	46°·4	39°·6	38°·1	...	46°·1

If we compare the monthly mean of the burials for 108 years with the mean monthly temperature for 13 years, the close, or rather the almost exact, inverse relations of interments to temperature are very apparent.

The close relation of mortality to temperature has often been pointed out in this Journal. In these cases, *large population* and *short time* have been dealt with; but in the present case, *small population* and *long time* are dealt with, and the same result is disclosed.—*Journal of the Scottish Meteorological Society*, April.

SMALLPOX, says the *Lancet*, caused altogether twenty-nine deaths in the eight principal towns of Scotland during the month of May last; in London alone the deaths from that disease in the same month were over 1200. Making every allowance for the difference of population, the difference of mortality from this cause alone is as 13 to 1. The epidemic does not seem as yet to be greatly checked, but, on the whole, it seems to be declining.

PRESENTATION TO DR THOMAS KEITH.—On 2d June, an influential committee of medical men, headed by Dr Christison, presented to Mrs Keith, on behalf of seventy-nine subscribers, a portrait of her husband by Mr Reid, and a service of silver-plate. In making the presentation, Dr Christison said that the reasons for this presentation were the admiration of Dr Keith's professional brethren at his great success in treating one of the most terrible diseases which may affect the life of woman, his disinterestedness, his fine character, and his devotion to duty, and their appreciation of the sacrifices he had made in the pursuit of his object.

EUTHANASIA CANNABINA.—In the United States hanging is performed by jerking a man upwards, and not by letting him fall, and death does not ensue till after the lapse of from ten to fourteen minutes, respiration and circulation going on during that period in a gradually decreasing ratio. Nay, it is alleged, that in the case of one Rullof, who was recently hanged in the States, he had his hands in his pantaloons' pockets when jerked up, and that the right hand being shaken out, he coolly replaced it, moving it for that purpose a distance of three or four inches. The ordinary drop in this country is only three or four feet, and it is equally inefficient in producing sudden death. Of late, Professor Haughton has propounded a formula,—" Divide the weight of the convict in pounds into 2·240," the quotient obtained will give the length of the drop required in any given case to produce instant death by fracture of the vertebræ (*vide* our No. for Nov. 1870, p. 476). This long-drop system is inconvenient, however, from the length required, fourteen to twenty feet being a very ordinary length, and one not always easily obtained within the precincts of a jail. Besides, the unseemly result of decapitation has been attained, though this is said to have been solely the result of a rope ill made and defective in resiliency. Quite recently, Dr Barker, surgeon of the Melbourne Jail, has propounded, in the columns of the *Medical Times and Gazette*, a method of hanging equally certain and expeditious in promoting death as Haughton's long drop, and yet only requiring the ordinary and easily-procured drop of three or four feet. We shall allow him to describe his method in his own words:—"It was by chance that I was able to suggest the present method, merely through the bungling of the hangman allowing the knot to slip and come on the spine. I have the knot put about two inches from the spine, so that when it is tightened by the weight of the body the knot comes on the vertebræ; by the fall the body has an impetus forwards, the resistance being at the beam to which the rope is fastened; the knot acts as a fulcrum to push the head forwards. By this arrangement, in all cases where the knot has been so situated, I have found there was a dislocation between the second and third cervical vertebræ, with fracture of the third, and pressure on the spinal cord. I have always found laceration of the sterno-cleido-mastoid muscles, the muscles attached to the larynx, laceration of the larynx, and generally fracture of the hyoid bone, death in this case resulting from the injury to the spinal cord. Death is so sudden and complete, that in one case a lock of hair which a man held in his hand at the time of the drop was found in his hand when he was cut down at the end of the hour; in two or three other cases pocket handkerchiefs have been similarly retained and found in the criminals' hands when taken down. I have seen no movement of the upper extremities, but occasionally a little convulsive or perhaps reflex action of the lower." A still more recent writer in the same journal recommends what is probably the best and most perfect mode of promoting a euthanasia under such circumstances, that is, to make the cap, drawn over the convict's face before the drawing of the bolt, of oiled silk lined with cotton-wool, to saturate the cotton with methylic ether, and secure the cap round the neck by means of an elastic strap. Forty-eight seconds' inhalation of this agent are sufficient, according to Dr Richardson, to produce insensibility to pain, so that the time between the adjustment of the rope and the drawing of the bolt would be amply sufficient to ensure a painless death. It is obvious that here any question of the safety of the anæsthetic would be quite out of place, rapidity of action being the great desideratum.

FASHION IN FOOD.—Many a man will naturally and surely say, "I am careful; I have not yet wasted, and therefore cannot save bread or meat." Still he may find out the way of contributing to the result. At the present time our whole people are eating wheaten bread, and therefore the great burden of food falls on wheat. If wheat is scarce, it becomes dear, because no substitutes are consumed. Here comes a case:—Maize is an article of food used by others, which we do not use; yet our brethren in New England are fond of it, and they have the choice of wheat. It is from the want of habit and practice of using maize that the population do not resort to it; but if maize were brought sometimes into the variety of a well-to-do house, servants would learn how to deal with it, and they would use it in other houses and in their own when they marry.—*Food Journal.*

Waste Food.—In the matter of our daily food some is left on our plates, some goes into the fire, some into the grease-pot and to a marine-store dealer, and some into the dusthole. Now, it is true that we have the prerogative to do this, for the food is our own, and we have paid for it. We have paid the baker and the butcher, but we have not paid the Maker of the food, and can give no money to Him. Of Him we have only a right to obtain for our own wants with due regard to the rights of our neighbours.—*Food Jourual.*

Appointment.—George May Lowe, M.D. Ed., of Lincoln, has been appointed Public Analyst for the division of Lindsey of that county.

OBITUARY.

James Watson, M.D.—At the ripe age of eighty-four, this well-known "Father" of the Glasgow faculty has passed to his rest. It is not often that any of our hard-worked profession attain to such length of years, and in Dr Watson's case it was not reached by any sparing of the work. For fifty years he was in harness, and, besides a large private practice, he discharged the duties, first of Surgeon, and afterwards of Physician to the Royal Infirmary, and also those of Physician to the Fever Hospital in Clyde Street. He was three times President of the Faculty of Physicians and Surgeons, Glasgow; and a portrait which hangs in the Faculty Hall, and the foundation of a "James Watson" prize, attest the affectionate esteem in which he was held by his medical brethren. Dr Watson has been retired from the practice of his profession for fully ten years, and leaves a family of four daughters and one son to mourn his loss. His son, Dr Ebenezer Watson, is Professor of Physiology in the Andersonian University.

William Hill, L.R.C.S. Ed.—On the evening of the 10th of June, this devoted and popular practitioner departed this life in the sixty-ninth year of his age. Besides his large private practice, he for five-and-twenty years did the work of a parish doctor without fee or reward, often paying for the needful medicines and wine from his own limited means. The people of Portobello and of Duddingston generally fully appreciated his disinterested and kindly services, and twice over presented him with a handsome testimonial; while his funeral, which was a public one,was attended by upwards of 600 of his fellow-townsmen, comprising all the best known men in the district.

M. Cocteau, surgeon of the Central Bureau, died, in the very commencement of a most brilliant career, by disease brought on by overwork in the hospital and in ambulances. (M. Cocteau's work on ligature of arteries was reviewed in our pages within the last year or two.)

M. Ehrman, surgeon-in-chief, son of the venerable Dean of the Faculty at Strasburg, died at Mans, in consequence of wounds received in battle.

M. Coindet, surgeon-in-chief, having escaped the dangers of the Crimea, Mexico, and Sedan, was killed by a French bullet, close by the Hôtel de Ville, in one of the miserable days of the siege.

M. Blanc, of the military hospital at Vincennes, died of a purulent infection, after a puncture he received on the finger, while dressing a wounded Prussian.—*Gazette des Hôpitaux.* No. 119, 1870.

M. Longet, the distinguished physiologist, died at Bordeaux, aged sixty-eight, broken-hearted, it is said, at the deplorable news from Paris during the reign of the *Commune.*

Dr Frederic Holst, late Professor of Pharmacology in the University of Christiania, died there on 4th June last, aged seventy-nine.

PUBLICATIONS RECEIVED.

Lionel S. Beale, F.R.S.,—The Physiological Anatomy and Physiology of Man. London, 1871.
James Hardie, M.D.,—On the Pathology of Club-foot. London, 1871.
John Hawkes, M.D.,—On the General Management of Public Lunatic Asylums in England and Wales. London, 1871.
T. Holmes, M.A., — System of Surgery, vol. v. London, 1871.
Carsten Holthouse, F.R.C.S.,—The Proper Selection and Scientific Application of Trusses. London, 1871.
Morell Mackenzie, M.D.,—The Use of the Laryngoscope. London, 1871.
Sir James Y. Simpson, Bart.,—Selected Obstetrical and Gynæcological Works. Edinburgh, 1871.
St George's Hospital Reports, vol. v., 1870. London, 1871.
Thirteenth Annual Report of the Commissioners in Lunacy for Scotland. Edin., 1871.
Richard John Waring, M.D.,—Manual of Practical Therapeutics. London, 1871.
Charles West, M.D.,—The Nervous System of Childhood. London, 1871.

PERIODICALS RECEIVED.

American Journal of Obstetrics,—May.
American Practitioner,—June.
Australian Medical Gazette,—March.
Berliner Klin. Wochenschrift,—May 29 to June 19.
Births, Deaths, and Marriages, Monthly Return of,—May.
British Medical Journal,—May 27 to June 24.
Bulletin Général de Thérapeutique,—May 30.
Doctor, The,—May, June.
Dublin Quarterly Journal of Medical Science,—May.
Food Journal,—June.
Gazette des Hôpitaux,—October 11, 1870, to February 11, 1871.
Gazette Hebdomadaire de Médecine, etc.,—Feb. 3 to March 3; March 31 to June 16.
Journal of the Scottish Meteorological Society,—April.
Kansas City Medical Journal,—April.
Klinische Monatsbläter für Augenheilkunde,—Oct. to Dec. 1870; Jan. to March 1871.
La Crónica Oftalmológica,—June 12.
Madras Monthly Journal of Medical Science,—May.
Medical Press,—June 7.
Medical Times and Gazette,—May 27 to June 24.
National Medical Journal,—May, June.
New York Medical Journal,—April.
Philadelphia Medical and Surgical Reporter,—April 29 to May 13.
Philadelphia Medical Times,—May 15 to to June 1.
Practitioner,—June.
Revue de Thérapeutique Medico-Chirurgicale,—May 21.
Virchow's Archiv,—May 12.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*On the Principles which have determined the Classifications of Mental Diseases.* By ARTHUR MITCHELL, A.M., M.D., etc., one of Her Majesty's Commissioners in Lunacy for Scotland.

THE object of this paper will not be to disclose and advocate any particular classification of mental diseases, but rather to exhibit the principles which have determined the various classifications hitherto proposed. The broader and more general aspect which is thus given to the subject may possibly relieve it of some of the dryness which it would otherwise possess.

Acting on the old counsel, that it is foolishness to make a long prologue, I place myself at once *in medias res* by describing to you the classification which was proposed by Pinel.

This classification embodies the views of a well-known and careful observer, and goes sufficiently far back for our purpose. It was in the opinion of its propounder a system of nosology "founded in nature;" and the sense in which he thought this true will be seen from the following quotation:—"The powers of perception and imagination," he says, "are frequently disturbed without any excitement of the passions. The functions of the understanding, on the other hand, are often perfectly sound, while the man is driven by his passions to acts of turbulence and outrage. In many lunatics a periodical or continued delirium is united to extravagance or fury. Again, instances are not unfrequent of actual dementia or mental disorganization, where the ideas or internal emotions appear to have no connexion with the impressions of sense, and to succeed each other without order, and to vanish without leaving any traces of their existence. A still more deplorable condition is that of a total obliteration of the thinking faculties, or a privation, more or less absolute, of all ideas and emotions."

In these words Pinel stated the basis of his classification so tersely and clearly, that we can see what it is to be, before he has actually told us what it is,—namely, the very familiar division into 1. Melancholia; 2. Mania; 3. Dementia; and, 4. Idiotism.

Though these terms, in Pinel's understanding of them, covered substantially the same conditions which they still do in our acceptation of them, there were some differences. His melancholia, for instance, was a delirium directed upon one object or series of objects, and accompanied with sadness. He had a mania, again, without disorder of the understanding. His dementia was a weakness of the mental powers, while his idiotism was a high degree of this weakness, at whatever time of life it presented itself, and whatever its history was.

The great feature of this classification is, that it rests on the character of the existing mental phenomena. The differences in these phenomena were regarded as indicating different lesions or different diseases, and they constituted different species of derangement. In other words, the disease which one patient laboured under was melancholia, while another laboured under mania, and another under dementia. The classification, in short, rested on the idea that insanity was a lesion of the understanding itself, and not a corporeal lesion, of which the disorder of the understanding was a mere consequence or symptom.

So much, then, for Pinel, whose work was published about eighty years ago.

I pass from it to another work, published so recently as the year 1869, and also a work of authority, namely, "The Nomenclature of Diseases," drawn up by a Joint Committee appointed by the Royal College of Physicians of London.

In this work, insanity is properly included under Diseases of the Nervous System, which are in four great divisions:—1. Diseases of the Brain and its membranes; 2. Diseases of the Spinal Cord and its membranes; 3. Diseases of the Nerves; and 4. Disorders of the Intellect. It will be observed that the Committee speak of *diseases* of the brain, *diseases* of the spinal cord, and *diseases* of the nerves, but of DISORDERS of the intellect. What they understood to be the difference between diseases and disorders is not stated, and the use of the word *disorders* in reference to the intellect has probably been adopted as some sort of acknowledgment that it was felt to be scarcely correct to talk of diseases of the intellect; but no way of wholly avoiding it appears to have been seen.

When we turn to the divisions of the sub-class Disorders of the Intellect, we find very little change from Pinel's time, for they consist of—1. Mania; 2. Melancholia; 3. Dementia; 4. Idiotcy and Imbecility; and, 5. Paralysis of the Insane. In other words, they are still divided into disorder of the intellect with depression, disorder of the intellect with excitement, disorder of the intellect with feebleness or loss, and congenital absence of intellect. To these, however, is curiously added, as a separate division, *the general paralysis of the insane*—a disease whose very name indicates that it manifests itself by physical as well as by psychical signs, or that it is a disorder of the body as well as of the mind. Except for this anomalous interjection, this classification of mental diseases is substantially, if not identically, the same as that of Pinel. It is certainly determined by the character of the mental phenomena, and constitutes depression, excitement, and loss or absence of intellect into different diseases, or at least into different forms of disorder of the intellect.

If, therefore, we are to judge by the latest authorized nomenclature of diseases, matters are still very much where Pinel left them, as regards the classification of mental diseases.

Any such conclusion, however, would be a mistake, for many writers have shown great uneasiness in accepting this old classification, and other classifications have at various times been proposed.

These efforts to introduce a better classification have been made in two directions. Of the one, the mental phenomena under a different aspect continue to afford the basis. But the other tries to link these phenomena to the bodily diseases which give rise to them.

I shall give, as briefly as I can, one or two illustrations of the first. It will not be necessary to give them in great detail.

Esquirol, for example, changed the classification of his master by the addition of Monomania, and by giving to Dementia and Idiotcy the meanings which we now give them, making the first indicate deprivation, and the second privation of the intellectual faculties.

Prichard, again, divided all mental diseases into two classes; those in which the understanding or rational powers are affected, and those in which the moral or active principles are disordered; in other words, into intellectual and moral insanity.

Dr Bucknill thought that insanity might be intellectual, emotional, or volitional; but his fellow-worker, Dr Daniel Tuke, thought that a sounder metaphysical division would be into disorders of the mind involving, (1) The Intellect, (2) The Moral Sentiments, or (3) The Propensities; but he ended by adopting a division into Idiotcy, Dementia, Delusional Insanity, Emotional Insanity, and Mania.

Perhaps the most ingenious of all those classifications, which are founded on the mental symptoms, is that adopted by Dr Maudsley in his work on the Physiology and Pathology of the Mind. In his later work, entitled Body and Mind, he appears to have somewhat modified his opinions; but when he wrote the work referred to, he regarded the different varieties of mental disease as falling naturally into two great divisions: (1) Affective insanity, including moral and impulsive insanity; and (2) Ideational insanity, which might be either partial or general.

It will at once be seen that these classifications differ from that of Pinel and the London College of Physicians in this, that, although they still have the mental phenomena as their basis, they make the different forms of insanity depend on the different parts or faculties of the mind which are involved in disorder, and not simply on the exhibition of excitement, depression, or defect in the mental state. So far, therefore, this is the introduction of a new principle —to this extent at least, that it is another way of looking at the mental symptoms as a basis of classification.

Such efforts, however, to improve the classification of mental diseases have not produced anything very useful or novel—a fact which would probably surprise one of Pinel's early annotators, who exclaims, "What difficulties can baffle the ingenuity, or impede the progress, of the thoroughbred metaphysician?" And it stands as a fact that Pinel's old division is not yet dethroned, being that recommended about a couple of years ago by the College of Physicians, and that which is still practically adopted all over the country.

But I come now to show that, in spite of this, there is very broadly a sense of its unsatisfactoriness, and a certain feeling of shame at being unable to get rid of it. In what respects these feelings are well founded I hope to be able to show; and I think I shall best do so by illustrating and explaining the second direction which has been taken in the efforts made to improve the nosology of mental diseases—that, namely, which grounds the classification on the bodily diseases which give rise to the insanity.

Long before any systematic effort was made in this direction, its coming was in various ways foreshadowed. Writers, for instance, who still kept to a classification founded on mental symptoms could not avoid devoting chapters to the discussion of such special subjects as puerperal insanity, choreic insanity, cataleptic insanity, epileptic insanity, general paralysis, delirium tremens, rheumatic insanity, and so on. They are found treating these as distinct forms of mental disorder, apparently, too, without any surprise that they were thus treating them *separately*, and *not* in one of the chapters headed *mania*, or *melancholia*, or *dementia*. Even in the nomenclature of the London College of Physicians, to which I have referred, far away from disorders of the intellect, we find puerperal mania given as a distinct disease. Delirium tremens, too, stands quite apart; so do hysteria, hypochondriasis, and general paralysis. Yet in all these the intellect is disordered, and in some of them gravely so. And the disorder may exhibit either the state of mania, or of melancholia, or of dementia, and may involve either the intellect, or the emotions, or the propensities. But the relation of the mental disorder to some bodily disorder is in these cases so apparent, and forces itself so strongly on the attention, that it is felt they must be discussed and studied together—the mental phenomena sinking into the position of mere signs of some bodily disease.

Indeed, the London College has lifted those conditions, in which the relation of a mental to a bodily state is quite manifest, altogether out of the class of mental disorders, and has given them a position among bodily disorders. This, however, is not done deliberately, or on any formulated principle;—it seems rather to be the product of a loose and unconscious acknowledgment that where such a view of insanity *could be shown* in a nosological system, it *should be shown*:—that puerperal mania, for instance, should not be separated from the puerperal state.

Some writers, again, make a more systematic and open advance, and enunciate a classification in which the mental phenomena are treated as symptoms, and the alliance between them and bodily diseases is made largely apparent. Notable among such authors are Morel and Schroeder Van der Kolk.

First, as regards Morel. He thought that mental diseases arranged themselves in six groups—viz.: 1. Hereditary Insanity; 2. Toxic Insanity; 3. Insanity determined by Neurotic Affections, like epilepsy, chorea, etc.; 4. Idiopathic Insanity; 5. Sympathetic Insanity; and, 6. Dementia.

It will be instantly seen that this classification is not based on the mental symptoms—either like Pinel's, with reference to manifestations of excitement, depression, or loss; or like Prichard's or Bucknill's, with reference to the particular faculties of the mind which exhibit disorder. On the contrary, it affects to rest chiefly on the nature of the predisposing and exciting causes; and Morel endeavoured to show that similar causes generally produce similar mental derangements, so that hereditary insanity, for instance, becomes to some extent recognisable by the character of the mental phenomena a patient exhibits, as well as by his family history. In applying his classification, however, it is found that his first and fourth groups—hereditary and idiopathic insanity—are somewhat conveniently elastic, and are easily made to include any cases which do not readily fall into the other groups; while, in those other groups, we find cases with a right to be regarded as hereditary, which it would be very difficult indeed to dispute. Then his last class, dementia, is altogether out of harmony with the others, being determined solely by the character of the mental symptoms, and being, in fact, simply a class made up of patients drafted into it from the other divisions in the concluding stage of their disorder.

Schroeder Van der Kolk, again, feeling that every classification must be unsatisfactory which proceeded more from the morbid symptoms than from the nature and origin of the disease, reduced the different forms of insanity to two groups, which, he thought, served all considerations in a therapeutical point of view. The first group he called Idiopathic Insanity, because in it the brain suffers primarily. The second group he called Sympathetic Insanity, because in it the brain suffers secondarily. In this classification, therefore, every form of insanity is regarded as due to some bodily disease; but the defect of the system, as he carried it out, was, that sympathetic insanity, by long continuance, might, and in a large number of cases did, become idiopathic insanity; in other words, after the psychical function of the brain had been long deranged by the irritating influence of some distant bodily disease, such structural changes might be induced in the brain as would then make the insanity directly due to them, and no longer to a mere secondary or sympathetic disturbance of its psychical functions. This classification, like Morel's, had one great convenience. Every case which could not be shown to be sympathetic was easily classed as idiopathic.

Schroeder Van der Kolk looked on mania, melancholia, and dementia solely as symptoms—as nothing but different kinds of mental confusion and defect; and his classification, though imperfect and objectionable, is the expression of a desire to get nearer to the root of the matter by keeping the insanity in close association with its pathological origin.

At an international congress of physicians engaged in the treatment of insanity, which met at Paris in 1867, a classification was proposed more or less on the principles which guided Morel and Van der Kolk; but it wants homogeneousness, and exhibits evidence of many compromises, that is, of being made up of fragments of the various systems which the different members of the congress advocated, and it is not probable that it will ever be adopted. It consists of a division of mental diseases into (1) Simple Insanity, (2) Epileptic Insanity, (3) Paralytic Insanity, (4) Senile Dementia, (5) Organic Dementia, (6) Idiotcy, and (7) Cretinism.

I have now only to make allusion to one other effort to classify mental diseases. It is the boldest and the best which has been made in recent times. In a certain sense, the efforts of those writers to whom I have just been referring led up to it; but it distances them so far as to have all the merit of a new idea, and its author loses nothing of the honour it has brought him by what had been done before. It will be readily admitted that it has a special interest to medical men connected with Edinburgh, when I state that it was proposed by one so well known to them as Dr Skae, who gave it body in the presidential address which he delivered to the Medico-Psychological Association in 1863.

Dr Skae starts with the proposition that we ought to classify the varieties of insanity according to their natural history, which he calls a rational and practical basis. He shows that, in the actual presence of the insane, book-learning about mania, melancholia, emotional insanity, volitional insanity, and such other reputed forms of mental disease, is misty, disappointing, and all but useless; and he reminds us that whenever we are required to direct the treatment or predict the issue of a particular case, we invariably find ourselves making minute inquiries into its history, with the object of fixing the relations of the mental symptoms to some bodily state or bodily disease. Is it associated with parturition? we ask ourselves; with the arrival of puberty, or the cessation of the menses; with prolonged lactation; with hard drinking; with epilepsy, paralysis, or chorea; with phthisis, syphilis, or rheumatism? In such circumstances, he says, these are the points we find ourselves investigating. If we stopped with determining that the mental action showed excitement, or showed depression, there would be no feeling that we had determined anything that was likely to be useful. In other words, we instinctively endeavour to classify in our minds, for practical purposes, all cases of insanity according to their natural history or origin.

This, I think, is briefly Dr Skae's position,—a classification based on the bodily disease, of which the mental phenomena are merely signs. His experience led him to propose 27 groups. I shall not occupy time by naming them, but when I say that they include epileptic insanity, insanity of pubescence, climacteric insanity, general paralysis, delirium tremens, hysterical mania, puerperal mania, mania of lactation, traumatic mania, etc., their general character will at once be understood, and it will be seen that each division derives its character from the originating or accompanying bodily state.

Idiopathic insanity appears as the 27th, or last, in the list; and it serves in this classification a convenient purpose, as it does in others. Cases which cannot be referred to any of the other 26 groups find a place in the 27th. The more, however, that insanity is studied from this point of view, the fewer will the cases be which are thus classed as idiopathic.

In many of these groups the mental manifestations are understood to be distinctive, as well as the so-called natural history. For instance, in general paralysis, delirium tremens, uteromania, climacteric insanity, phthisical insanity, etc., there are mental phenomena which may safely be described as of tolerably steady occurrence, and which are at least sufficiently distinctive, when they present themselves, to suggest our looking for sexual excess, or hard drinking, or irritable ovary, or phthisis, as the case may be, in the patient's history. If this were broadly true of all the groups, it would of course be a point of the very highest scientific interest and practical value. It appears to me, however, to be sufficiently true to raise pleasing hopes as to the extent which our knowledge of the nature of healthy and unhealthy mental operations may yet attain.

Such, then, is an outline of this classification. That it is a great effort in a right direction, I believe to be very generally admitted; that it was complete, Dr Skae did not himself hold. It was rather a proposal out of which something else would ultimately grow. As yet, however, the efforts which have been made to improve it have not been attended with much success. That by his pupil, Dr Tuke, is perhaps the most formal and the best.

It would be easy to criticise this classification, and to show how its application is beset with difficulties; but it would always retain the special merit which Dr Skae claimed for it, "that it keeps ever before us the all-important principle, that insanity is a disease of the body, whether it be disease of some remote organ acting sympathetically, or disease of the brain itself."

We took insanity out of the domain of theology many years ago. The treatment of it is no longer associated with the sacerdotal office. There are priests, I suppose, at Besançon still, but they have ceased to cast out the demons which were supposed to possess maniacs and melancholics, and no one nowadays would own the repulsive theory, and say, "Deorum afflatu hic furor provenit." From the supernatural the separation may be regarded as nearly complete, unless, indeed, we admit that there is sometimes a savour of the supernatural about the metaphysics, in which mind is studied without reference to the body. From such metaphysics we desire as complete a separation as we do from priestly associations. The psychology of medicine has nothing supernatural about it. It studies and deals with mind only in its relation to the body; and it is by the aid of the laws evolved from this study, and by no other means, that medical men endeavour to show how mind can be saved from disorder, and how it can be restored to health.

I have now explained and illustrated as well as I can the *three* leading principles which have served as the basis of the different classifications of mental diseases. Nearly all others are merely modifications of these. The two first of those alluded to depend on the character of the mental phenomena, the divisions of one of them being determined by the manifestation in these phenomena either of excitement, depression, or loss; the divisions of the other being determined by the particular faculties of the mind which appear to be involved—the intellect, the emotions, the propensities, or the volition. The principle of these two classifications is easily understood. There is no attempt in them to link the disorder of the mind to its origin. But it is the very principle or basis of the third classification to do this. In it the mental phenomena are merely symptoms or signs, and its divisions are determined by the nature of the bodily states which give rise to these symptoms.

I stated at the outset that it was my object not so much to disclose and advocate a particular classification as to speak about those which have been proposed, in such a manner as to exhibit the principles on which they are founded, and the sense in which these are correct or serve useful purposes.

With this object in view, I proceed now to discuss more generally the value of the different classifications.

The first consideration which suggests itself is this:—There must be something about Pinel's old divisions into mania, melancholia, dementia, and idiotcy which makes them practically useful, whether they rest on a sound basis or not. Were it otherwise, they would scarcely have held their ground so successfully. Now, this is true. They *are* useful divisions, and I do not see how we could practically do without them. But it is very important that the nature of their usefulness should be rightly understood. Otherwise, they become injurious. I do not know if my meaning will at once be seen, but I think the nature of this usefulness is correctly set forth when it is said that it may be a good classification of the mentally diseased, though a bad classification of mental diseases. In other words, there is often a practical utility in dividing insane persons into maniacs, melancholics, dements, and idiots, but no accuracy in dividing their insanity into mania, melancholia, etc. For instance, a division of insane persons into the excited and violent, the apathetic and depressed, the idiotic and helpless, may be useful in that part of their medical treatment which relates to care and management. This being so, it is probable that we shall always speak of maniacs, melancholics, dements, and idiots; and, for certain purposes, the insane will continue to be grouped in our mind according as their mental disorder exhibits excitement, depression, or defect, without reference to the origin of that disorder. Thus, if a man's insanity be characterized by excitement and violence, it may lead to his removal to an asylum; while if his insanity be characterized simply by feebleness of intellectual power, he may be allowed to remain at home. Yet both insanities may be due to the same cause. The arrangements for the nursing and care of a group of helpless slavering idiots will be very different from the arrangements for a like number of violent and destructive maniacs. I say violent and destructive maniacs, and the very use of the words *violent* and *destructive* here illustrates the point of which I speak. There are maniacs and maniacs. There is a mania which is attended with but little excitement, and a melancholia which is by no means profound. Hence we speak of the violently maniacal, the deeply melancholic, the utterly demented, and the helplessly idiotic; and we have often a useful practical purpose to serve in thus indicating not only the character of the mental phenomena, but also the degree of that character.

In medical jurisprudence, again, we cannot avoid a classification of the insane according to their symptoms. Questions of capacity and responsibility refer directly to the kind and degree of mental derangement which the patient exhibits, and not to the pathological nature and origin of the patient's condition. These are questions of fact, which are answered by the actual symptoms. The law does not concern itself with the cause of the insanity. It merely wishes to know if disorder of the mind exists, and also if it exists to such an extent as to take away civil capacity, or give immunity from punishment.

Dr Blandford, in his recently published and valuable Lectures on Insanity and its Treatment, holds very much the same views as those which are here expressed.

In their proper place, then, Pinel's divisions have their use, but when they are allowed to become true forms of mental disease, it is a scientific blunder, and harm is done. It leads to contentment where there should be no contentment; it stops inquiry where inquiry should begin. We say of a patient that he labours under melancholia, and having said so—though the word in itself is nonsensical—we are apt to have the satisfied feelings of one who has given an opinion with a scientific meaning and value. But all we have really done is this: we have described a symptom; we have said that the mental phenomena in the patient's case show depression, and not excitement. In short, we have only declared that the patient is dull, depressed, or sad; but we have not in the slightest degree indicated what the cause of that dulness and depression is. It is just as if we said of a patient that he had a quick pulse, and stopped there, without going on to say that he had this in consequence of an attack of typhus or of scarlet fever, or of some local inflammation. It has been well pointed out that we never think of classifying respiratory diseases under the heads of hurried, slow, spasmodic, and deficient respiration. Yet we might as correctly do so, as make mental excitement, depression, or defect, distinct pathological species.

The fact is, a man may be imbecile or melancholic in the morning and maniacal at night. Indeed, in certain insane persons, fits of excitement, depression, and stupidity succeed each other in such regular order, that their condition has been designated *La folie circulaire.* Such persons go out of one class into another and another, and back again—their real disease being all the while entirely unchanged.

Many persons, on the other hand, are unquestionably insane whose mental state is such that we scarcely know whether to class them with melancholics or with maniacs—neither excitement nor depression being a prominent character of the mental action. Still further, mania and melancholia may be implanted on dementia; that is, we may have a dement who becomes maniacal without losing his dementia. Where would *he* stand? Under what form of insanity would *he* labour? Then, again, a state of mania almost surely passes into dementia if it lasts long enough. The transition, however, is not abrupt and sudden, but gradual; and if so, at what point does the patient cease to labour under mania, and begin to labour under dementia?

But I need not further illustrate either the weakness or the value of this classification. It must be clear to all that mania, melancholia, etc., are not diseases, but mere signs of disease, which may properly enough be compared with such signs of disease as the quick pulse, spasmodic breathing, hot skin, etc. It may often, as I have shown, be useful to arrange insane persons according to some common character of their mental symptoms, and this will do no harm so long as the nature of such divisions is correctly understood;

but whenever these divisions come to be regarded as involving distinct forms of disease, then harm is done—we stop with a symptom instead of going to its cause.

The more we do this last—that is, go to the cause—in dealing with insanity, the more useful will medical men be to the community, and the more dignified will be their attitude in relation to mental diseases. It may lead very often to the discovery and avowal of ignorance, but it will lead also as certainly, in the long-run, to an increase of knowledge, and a greater power to be useful.

In our endeavours to get at the cause—the real pathological state which gives rise to the insanity—we shall, to a certainty, be often baffled. Even when we are in the most favourable circumstances for making the inquiry, this will be the result. But it will happen with peculiar frequency in the circumstances in which we generally stand. *First*, because most of the cases of insanity which are submitted to us for opinion or treatment are a long way from their cause; *secondly*, because the causes of insanity are almost invariably of an exceedingly complex nature; *thirdly*, because, as a body of medical men, we have not yet been properly educated into a knowledge of the relations of corporeal to mental states, and we fail now to recognise what, with a sounder training, we might more easily do.

With reference to the first of these difficulties in getting at a rational classification, Dr Blandford well remarks that—"If we can examine the individual at the outset of the disorder, and thoroughly ascertain his history, we may be able to lay down with considerable accuracy his pathological condition." At this stage he may be neither maniacal, nor melancholic, nor demented. We may be dealing, in fact, rather with signs of approaching than of existing insanity, and it is then, of course, that the pathological origin of the disorder is most apparent. It is then, too, that the case is usually under the care of the ordinary physician; and, lastly, it is then, far more than ever afterwards, that the art and science of medicine can be of use. In perfecting a system of classification like that of Dr Skae, we must therefore look for help from those who see insanity at its outset—that is, from the general body of medical men; but we shall look in vain for large help from that quarter till we have prepared them to give it by suitable instruction.

When the insanity is of many years' standing, all trace of its origin is generally lost. The pathological condition which gave rise to it may, in fact, be past and gone. In this way there is a very large number of cases which, in the present state of our knowledge, we should not be able to classify. But this is a difficulty which should stimulate to exertions to overcome it, since we know that in every case, whether we can detect it or not, there must have been such an origin.

There are other cases, however, which, from the very outset, are involved in obscurity. The insanity may come by an explosion, or it may grow most insidiously, and in neither case may we see any evidence of bodily disease to yield a satisfactory explanation. But here, too, we should only be stimulated to further search; and we are encouraged by the fact, that such seemingly hopeless inquiries have already yielded the fruit of success.

There is evidence, indeed, that this classification of mental diseases, or more correctly, perhaps, this standpoint from which we are to regard insanity, has taken possession of the medical mind. We cannot need a better proof of this than we find in the titles of the papers which, during the last six years, have filled our journals both in this country and on the Continent—such titles for instance as these—On Rheumatic Insanity, On Choreic Insanity, On Epileptic Insanity, On the Insanity of Pregnancy, On Puerperal Insanity, On Hereditary Insanity, On Phthisical Insanity, On Cancerous Insanity, On Climacteric Insanity, On the Insanity of Pubescence, On Sympathetic Insanity, On the Insanity of Lactation, On the Mania of Alcoholism, On Syphilitic Insanity, etc.

The opinions of many systematic writers, too, appear to be undergoing a change. Dr Maudsley, for instance, in his Gulstonian Lectures, recently published, has somewhat altered his position. He says, "The hope and the way of advance in our knowledge of mental disorders lie in the exact observation of the varieties of the insane diathesis, and of the effects of bodily functions and disorders upon these; in noting carefully the bodily as well as mental symptoms that characterize the several forms of derangement of mind; and in tracing the relations of mental to other disorders of the nervous system."

All this shows the direction which has been given to recent inquiry.

The first effect will probably be greatly to increase the twenty-seven groups of Dr Skae; but there will then begin a grouping of the groups, as some common pathological origin is detected; and in the end, I believe, we shall get to a very much smaller number than that with which we may be said to have started. And as we do this, we shall, in all probability, be at the same time reaching a classification which will more and more correctly admit of being described as resting on pathology.

Even then, however, we may find it useful and convenient to talk of diseases of the mind—of disorders of the intellect—of the physiology and pathology of the mind—of mania, melancholia, and dementia; but we shall know exactly what we mean by such terms, and we shall not be misled by them. We do not now speak of diseases of the sight, but of diseases of the eye; it will be a long time, however, before we are in a comparable position as regards insanity. In the meantime good work, in a right direction, is being done, and insanity has the hope of becoming, more correctly and fully than it ever has been, a part of medical science. The only secure foundation of the therapeutics of mental diseases, as well as of their classification, lies in a knowledge of their nature and origin. The less we know of this, the feebler is the art of healing. Feeble it is at the best, but the more of such knowledge we have, the stronger grows our ability to avert and cure. To get at that knowledge is admittedly difficult, for the altered mode of action of the mental faculties is often the only sign of disease in the insane. It may be so prominent as to mask the corporeal disease to which it is due, and the general health of the patient may appear to be good. The connexion between bodily or cerebral and mental states is often most obscure; the result perhaps, in many instances, of our imperfect knowledge of the functions of the different parts of the brain. "For although the brain," as Schroeder Van der Kolk observes, "has been most accurately investigated by anatomists, and has been described in its minutest details, yet Richerand's assertion still holds good, that the physiological anatomist finds himself here in the same case as the Parisian porter, who knew indeed all the streets and alleys, to the smallest, but did not know what happened in the houses."

ARTICLE II.—*Notes of a Case of Ovarian Disease—Ascites—Anasarca—Solid Tumour in both Ovaries.* By W. J. MARSHALL, M.D. and L.R.C.S. Edin.

(*Read before the Greenock Medical Society*, 6*th March*.)

ABOUT the middle of November 1870, I was called to visit Miss A. R., æt. eighteen, a pupil-teacher. She was a rather pale and delicate-looking girl. She was then suffering from a slight catarrh. I was informed that she had always enjoyed good health until the month of June, when she had ceased to menstruate. Except being more easily fatigued, and finding her abdomen latterly increasing in size, she did not suffer much uneasiness, and continued to attend to her duties at school till I saw her. About July she first felt as if something moved in her abdomen, and some friends began to remark upon her altered appearance; but, strange to say, her mother did not notice anything unusual till shortly before my visit.

After one or two examinations at intervals of a few days, the following facts were noted, and a diagnosis arrived at:—The abdomen was found considerably enlarged, measuring 34½ inches in circumference at the umbilicus. The skin of the abdominal wall was œdematous, and fluctuation was detected by palpation. On sudden pressure a sensation, as of fluid being displaced, was communicated to the palm of the hand, which came down upon a solid body lying to the left side, and stretching, as made out by combined percussion and palpation, from the brim of the pelvis to as high as the umbilicus. Per vaginam, the cervix uteri felt rather elongated and pointing forwards. On pressing between the finger in the vagina and the hand laid upon the abdomen, a sensation of fluctuation and of a solid body in fluid was communicated, a sort of quasi-ballottement. As the amount of fluid increased in the abdomen this sensation was no longer felt. On pressing upon the upper extremity of the tumour the cervix uteri was unaffected; but on pressing in close upon the pubes, a movement could be communicated to the cervix uteri. The urine was pale, depositing mucus, sp. gr. 1025, and no albumen was then detected by heat or nitric acid. Immediately after one of my examinations the patient menstruated for the first time for five months. The diagnosis was made of a tumour of the left ovary with ascites; but from the œdematous state of the abdominal walls, and the amount of fluid in the peritoneal cavity, nothing more definite as to the character and relations of the tumour could be made out.

I recommended my patient to consult Dr Thomas Keith of Edinburgh. She travelled to and from Edinburgh in one day, in the beginning of December. Dr Keith expressed an unfavourable opinion of the case. The fatigue and excitement of the journey seemed to exert a prejudicial influence on the patient. The feet, legs, and thighs became very œdematous. The abdomen rapidly increased in size, till it measured 37 inches at the umbilicus. In the middle of December she again menstruated, and for a few days the urine became mixed with mucus and pus and deposited albumen. She began to suffer from cough and difficulty of breathing, and signs of fluid in the left pleural cavity were observed in the beginning of January. The face became œdematous, especially on the side on which she could lie with most ease (the left). She also suffered much from flatulence, and occasional vomiting and purging. The pulse rose to about 140, and became very weak. On the 6th of January it was reported that she had become so faint once or twice during the night that her mother thought she was about to die. She, however, rallied a little and began to make more water, which became clear and free from albumen. The œdema and ascites diminished very greatly, leaving white streaks on the skin of the thighs, legs, and abdomen, such as are seen on the abdomen of women who have borne children. A day or two before she died the abdomen measured 35 inches, but the signs of effusion in the pleural cavity were more pronounced; and she died, rather suddenly, on the 24th of January, on making some movement while sitting up in bed.

The treatment in this case consisted in giving mild diuretics and diaphoretics, and latterly stimulants when the system became more exhausted. The propriety of tapping to give relief to the great distention and difficulty of breathing came up for consideration. Dr Wallace saw her with me in the month of December, with a view to deciding upon this point. We agreed to defer the operation as long as possible, since the general symptoms were so untoward.

Dr Keith also saw her again in the beginning of January, and he was likewise of opinion that paracentesis should not be performed unless it was urgently called for. It was well it was not done; for when the patient seemed at the worst, the kidneys began to act more freely, and the general dropsy was very much reduced before her death.

Dr Keith did not consider the case at any time suitable for ovariotomy, and seemed inclined to the opinion that the tumour was malignant. The rapidity of its growth, and the amount of ascites and general dropsy accompanying the tumour, were elements in favour of such an opinion.

On the 26th, with the assistance of Dr Wallace, an examination was made of the abdomen. On opening the peritoneal cavity, about a wash-hand basin full of a clear and rather deep yellow-coloured serous fluid escaped. There were no signs of peritonitis; the uterus was found natural in size; both ovaries were much enlarged, and of a kidney shape. The left, which was about six inches in its long diameter and three in its transverse, lay diagonally across the abdomen, the lower end lying just behind the fundus uteri, and the upper stretching into the left side of the abdomen to the level of the umbilicus. The right ovary was about five inches by three inches, and lay up and down behind the uterus —the upper end just appearing behind and above the fundus uteri, and touching the lower end of the left ovary—the lower end lying in the hollow of the sacrum. On being cut into, both tumours were found solid, and of a rather pale flesh colour. At some parts the colour was deeper apparently from congestion, and this was especially marked in the lower end of the right ovary, which lay in the hollow of the sacrum. A few small cavities about the size of peas, containing clear fluid, were seen here and there through the structure, and one or two small deposits of a yellow cheesy matter were found in similar cavities near the surface. The great bulk of each tumour was of a solid fleshy consistence and colour, and was traversed by vessels of considerable size, many of which were filled with thrombi. A small portion of the cheesy matter was examined under the microscope by Dr Wallace and myself, and exhibited small nucleated cells, and a few fat cells. A small portion of the fleshy matter exhibited a great number of small nucleated cells, principally of an oval shape, a few granular cells of a larger size and a few fibres running through the mass of nucleated cells.

Dr Wilson Fox of London also examined a portion of the tumour, and he writes:—

"It appears to consist of a purely fibroid structure. There are very few fibro-plastic cells, and no traces of glandular structure. The fibrous material consists of a very dense interlacement of fibres, and closely resembles the natural stroma of the ovary. In fact, judging from this small piece, I should say that it represents a hyperplasia of the ovarian stroma, in contradistinction to the growths consisting of a hyperplasia of glandular structure. There were some indications of non-striated muscular fibres, but I do not feel very certain about these."

The other viscera of the abdomen seemed natural in size, colour, and consistence, but were not cut into. The chest and head were not examined.

As the patient's health was not much affected when I first saw her, the diagnosis was a matter of some perplexity for a time. The tumour, on external examination, felt very much like the uterus enlarged. It was not till one or two examinations had been made that it was evident that the tumour was separate from the uterus. One attempt was made to use the uterine sound, but it could not be passed more than one inch, and it gave so much annoyance that it was not employed again. The return of menstruation, taken in connexion with the elongated cervix, and the absence of placental souffle or fœtal pulse, negatived the idea of pregnancy.

The peculiar relation of the two ovaries explains how they felt as one mass. They lay in close apposition above and behind the uterus, so that, on pressure per vaginam or on the abdominal wall, motion was communicated through the one tumour to the other. This also accounts for that sensation of quasi-ballottement, which was somewhat deceptive in the earlier examinations.

Solid fibrous tumours of the ovaries seem to be rare, and are generally of a much smaller size than was attained in the present instance. There is an interesting case (in which both ovaries were enlarged to about the same size as in this case) mentioned by Dr Bright in his work on "Abdominal Tumours" (Syd. Soc. ed., p. 146).

I have ascertained that my patient's father and a sister of her mother's both died of consumption. It is interesting in this connexion to note the existence of tubercular matter in minute spots on the surface of both ovaries, evidently secondary to the fibrous degeneration. Rokitansky says:—"The occurrence of tubercle in the ovaries is at least doubtful; so far as our own investigations and observations go, we must deny it altogether."

ARTICLE III.—*Notes of a Case of Scleriasis.* By WM. CURRAN, L.R.C.P. Edin., M.R.C.S. Lond., etc., Army Medical Staff.

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THE strange cutaneous condition called scleriasis is so rare in this country, and the disease was so well marked in the case under review, as to call for a special record for itself, and the following statement, based as it is on long personal intercourse with the subject of it, will, it is hoped, fairly describe its most salient features, and convey, at the same time, some idea of its history and progress. It was first drawn up at the instance of a high official authority, in view to its appearing in the pages of the departmental blue-book; but the materials for that ponderous compilation having been already so far adjusted as to preclude the possibility of its insertion in this year's issue, it had to be withheld, and hence the cause of its publication elsewhere. The case is transcribed almost *verbatim* as it stood in the original. It is the only instance of the kind the writer has ever seen, and he hopes its perusal may prove as interesting to others as its observation did to him.

The subject of the disease, No. 1556, Private G. E., of the 2d/11th Regiment, was admitted for treatment to the General Hospital, Phœnix Park, near Dublin, on the 4th December 1870. He is 29 years of age, and has eleven years' service, some eight or nine of which have been passed abroad at the Cape, and he looks the very *beau idéal* of rude and vigorous health. On admission, he was found by the officer then in charge of his ward to be suffering from an affection of the skin, or rather perhaps of the subcutaneous cellular tissue, which rendered the integument all over the body hard, brawny, and slightly redder than usual. This redness or suffusion is more observable on the face than elsewhere, but it extends also over the chest and trunk, and imparts to both a tense, shining, and somewhat tanned or mummified appearance. He says, however, that he was always of a reddish or ruddy complexion; but this is not the only or even the most noticeable feature of his case, and the immobility of the countenance, and the absence of expression in the face, are more calculated to attract attention. The skin is everywhere hard, tense, and immovable; the tension of the cheeks prevents the mouth being widely opened; the play of the facial structures is in great part lost, and he cannot raise the brow or move the hair in consequence of the rigidity and stiffness of the skin over the occipito-frontalis muscle. His general health is good, but he suffers occasionally from a feeling of giddiness and headache, of however no great severity. He complains of a numbness at night in the side or part on which he lies in bed, and his movements are impeded by the tightness of the skin over the patellæ and other joints. He also complains of a slight feeling of cold or chilliness on lying down, but the temperature, as ascertained by the thermometer, has never varied, and now stands at 98·4°. The pulse is quite normal, and the other functions are discharged with regularity and ease.

His history is a peculiar one, and the leading features of his case are equally so, and both point unmistakably to a condition of the integument which has rarely been witnessed, as far as I can determine, in an equally authentic or pronounced form, in this country. When seen by me for the first time, early in February of the present year, he was suffering from a hardness and rigidity of the skin over the whole surface; the integument of the face was tightened, brawny, and shining; he was, in fact, hide-bound all over, and the want of the power of expression in the countenance was very conspicuous.

He cannot open or purse out the lips to their natural extent; any attempt to frown or raise the brows fails to produce wrinkles on the forehead, and even laughing is productive of inconvenience. The skin covering the neck, chest, shoulders, arms, and legs is similarly affected; it feels, in a word, like a flitch of bacon, and as if it had received a coating of varnish or putty. The only parts that have escaped are the genitals, and, to a lesser extent, the upper eyelids, and the former appear to retain their usual size and outline. He also retains the sexual instincts and inclinations natural to his period of life; and this feeling, coupled with the absence of other constitutional symptoms, would seem to point to a local origin for his ailment. Though the surface looks œdematous, it does not pit anywhere on pressure, it cannot be raised in folds or made to move by friction, and, except that it is not cold, it "gives to the hand the sensation of touching a frozen corpse." Percussion of the lower part of the chest elicits a dull, heavy, leathery thud or sound; the abdominal walls feel stiff and brawny, as if something solid were let into their substance; and I am sometimes tempted to compare the impression made on me by palpation to that which is produced by feeling newly killed fat bacon, or—though in a smaller degree—parts affected by anasarca, phlegmasia dolens, or phlegmonous erysipelas. And yet it is neither one nor the other; it has something peculiar in itself, which can only be realized by actual touch, and which scarcely admits of being conveyed by description; and, of course, it differs from all three in not retaining any marks of pressure.

As in most of the cases that have been recorded, so also in this, the disease would appear to have commenced in a small spot or patch which appeared on the back of the neck, about the middle of January 1869, while he was serving at Cape Town. He can assign no cause for its appearance, and he adds that, after remaining stationary for three or four days, it began to increase in area round the neck, and then creep downwards gradually over the arms, trunk, and abdomen. It has all along produced a feeling of tingling and numbness in the parts on which he lies in bed, and though, as noticed before, there is no evidence of diminished temperature, friction and baths fail to produce perspiration. He cannot now raise the arms higher than the shoulders or freely finger the back of his head, and there is so much stiffness and catching under the armpits as to render it difficult for him to dress. On the 18th of March last I made the following note of his condition:—"This man has done little or no duty within the last twelve months, and his complaint has been stationary, or at most very slowly progressive during that time. As noticed before, it commenced in a reddish itchy patch of small size—not exceeding that of a florin—in the back of the neck, which felt at first painful and tender, but subsequently regained its normal tone, and which, increasing in area as it advanced downwards, ultimately extended to and implicated the whole body. His weight remains unchanged, but the skin is now so rigid, tense, and unyielding, as to resemble gutta-percha, and prevent him from rotating his arms, running with speed for any distance, or even walking continuously without inconvenience. It is tighter, however, in some parts than in others, and especially so over the malar bones, on the neck and chest, and under the armpits; and though the whole of the cutaneous surface, 'from the sole of his foot to the crown of his head,' from the occipital protuberance to the orifice of the anus, ay, and back again the other way, is tight fitting, tense, and indurated, he yet appears to enjoy life, and there is very little, if any, diminution of temperature, and none, as far as I can judge, of sensation or secretion."[1]

Treatment.—The treatment has been as various and exhaustive as the circumstances of his case or the appliances at the command of his professional attendants would allow. Every variety of bath has been resorted to, every combination of purge has been exhausted. Diaphoretics afford no relief, and bromide of potassium, nux vomica and alkalies, have been tried in vain. Nothing, in fact, seemed to reach the root of his disease or modify its character, and mercury to ptyalism, by inunction and otherwise, has made no impression on it. The same may be said of arsenic and shampooing, though it is but fair to add that these had not had sufficient time or trial, and he was brought before an invaliding board, for the purpose of being discharged from the service, before anything else could be tried. I anticipate that nothing but time, and that alone, will be able to influence the character of the disease, or modify its progress in the future.

Remarks.—The disease described above is so rare, that there has not been much opportunity of investigating its history or mastering the details of its pathology and causation, and the little I know of either is derived from an article on the subject in the "Guy's Hospital Reports for 1867," Series III., vol. xiii. p. 255-282, etc. The writer of that able paper, Dr Hilton Fagge, after quoting from various sources the cases of the disease that have been from time to time placed on record, says: "Its essential feature is a rigidity, beginning generally at some one spot, and rapidly spreading over the whole of the upper part of the body. In four of the six patients—whose cases he summarizes—it began at the back of the neck; in one, the part first affected is not mentioned; in the remaining case it began at the epigastrium. In this case the whole body is said to have been rigid, but in all the others the disease ceased at some line or other on the trunk. The parts hardened were so uniformly, but in one case the eyelids remained free, the rest of the face being affected; and in three instances the hands escaped the induration, which extended down to the wrists." In my case the genitals are the only parts that have *entirely* escaped, and there is no line of separation or demarcation anywhere. Again Dr Fagge says, "Pathological Transactions of London," vol. xx. pp. 403–409: "The essential feature of the *scléréme* of Thirial is the existence of induration and rigidity of the skin, beginning at some one spot, and rapidly spreading over a large part of the cutaneous surface."

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[1] In reference to this point, Dr Fagge has the following, at page 283 of his able and exhaustive paper (quoted below), to which I must refer for further particulars, and which I commend most strongly to the perusal of all who are interested in the elucidation of this rare disease:—" M. Thirial elsewhere states that in these cases"—namely, those reproduced—" there was neither change of temperature, impairment of sensation, nor diminution in the secreting action of the skin." Such was also the case with my patient in regard of the two former, but I believe I might bake him in an oven or bray him in a mortar without producing a *copious* perspiration.

I had a photograph taken,[1] which, however, does not show much, and can, indeed, scarcely be expected to do so, inasmuch as the disease is entirely subcutaneous, confined to the rete, or at farthest to the connective tissue, and due probably to a proliferation of cell-growth, the extent or amount of which can only be determined by the microscope. Whether the follicles are involved or not, I cannot undertake to say, and I am not aware that their share in its production has been as yet clearly defined. The photograph shows, nevertheless, the extent to which the arm can be raised, and that too by the aid of a little hitch or inclination which the patient has unconsciously taken to the opposite side; it shows the depression of the umbilicus from bulging, and prominence on the part of the abdominal walls, and a general contour of rotundity and *embonpoint* which can scarcely be credited in a state of health to so young a man. Dr Fagge recognises the existence of a complete chain of links[2] between the *scléréme* of Thirial—who first described or indentified the disease—and the keloid of Addison, but he refuses to acknowledge its relationship to leprosy; and, by so doing, differs *in toto* from the views of Erasmus Wilson and other dermatologists. Finally, and this is perhaps the most interesting point in the whole inquiry, he says that "the prognosis appears to be favourable;"[3] and adds, "In all the cases hitherto recorded, in which the patient has remained under observation, the skin has sooner or later returned to its natural state." I read this passage to my patient, and encouraged him, somewhat against my own conviction, however, to look forward with hope to the future. It was, I am sorry to say, the only aid or comfort I could afford him under the circumstances.

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[1] The photograph is not reproduced, for the reasons stated in the text, and others, that will obviously occur to the reader.

[2] With regard to this point, Dr Fagge says—"I have also brought forward cases to show that, between the two affections described respectively by Thirial and by Addison, there is a complete chain of connecting links in cases recorded by different observers, and that, if not included under one common title, they ought at least to be regarded as the opposite extremes of a series rather than as absolutely distinct."—*Transactions of the Pathological Society of London*, vol. xx. pp. 408-9.

[3] I am afraid that Dr Fagge's hopeful and kindly anticipations in respect of the prognosis of this disorder are not likely to be realized in the case reviewed above, and I can *now* recall some features of it which escaped my notice before, and which induce me to believe that the disease is progressing slowly but surely towards its natural termination. This, too, is the opinion of a friend in whose judgment I have very great confidence; and every physician is aware that a casual professional visitor may often observe changes in his patient

ARTICLE IV.—*On the Mode of introducing the Midwifery Forceps; with Note on their Modification.* By JAMES CAPPIE, M.D.

(*Read before the Obstetrical Society of Edinburgh*, 10*th May.*)

I HAVE no intention to furnish a complete essay on the midwifery forceps. I shall not at present discuss the various interesting points that bear on the questions as to when to use them, or how to work with them when applied. I restrict myself to a single point in their management; and one in regard to which, if we were to judge from the uniform instructions given in manuals of midwifery, it might be supposed there could be very little opportunity to suggest anything novel. In the directions for introducing the blades an almost stereotyped phraseology has been used by one writer after another, and as the practice I have been in the habit of following is in some particulars different from these directions, it may not be useless to bring the subject before this Society. I shall not be surprised, however, if I find that the plan I have now to suggest is one very frequently followed in practice, although not even alluded to in the ordinary text-books.

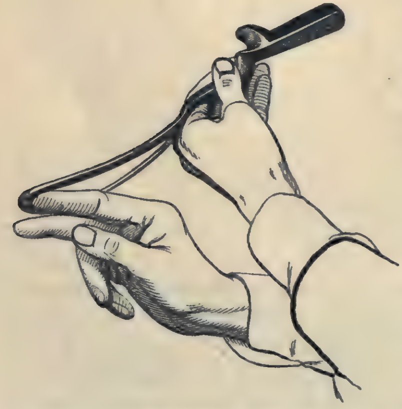
The instruction I have to criticise is, that in introducing either of the blades, it is to be held lightly in the right hand, and that two or more fingers of the left, introduced into the vagina, should guide the point of the instrument, and guard the parts of the mother; and the amendment I have to submit is, that the task of introducing, guarding and directing should be trusted entirely to the fingers of the right hand, and that, in the first stage of introduction, the left, crossed over the right wrist, should have little more to do than to support the shank or handle of the instrument. The advantages of this plan are that the ordinary obstetric position does not require to be disturbed,—that in many cases the instrument can be used positively with greater facility,—and, at all events, that in this way it can be applied in instances where it would be almost impossible in the ordinary way.

which are apt to be overlooked or ignored by the regular attendant himself. As regards the termination referred to above, if what I heard of one of Dr M'Donnel's cases before I left Dublin be true—and I have no reason to suppose otherwise—it resembles that produced by leprosy; and influenced by this and other considerations of a like kind, which need not be detailed here, I am inclined to believe that a closer relationship will be found to exist between these two complications than Dr Fagge is willing to allow.

At the outset, I must mention that my remarks are intended to apply to the double-curved instrument. My experience of the straight forceps has been limited, and, so far as it goes, decidedly unfavourable. In leverage power, and in the thorough command we have over it, it is greatly inferior to the long forceps.

The first objection I have to the ordinary instructions is the awkward position in which we are directed to place the patient. She is to lie as much as possible right across the bed, and, according to some writers, the nates are to be made to project over its edge. To put her in this position, of course involves trouble to the patient, and all the anxiety to her and her friends that attends preparations for what is regarded as a serious operation. It will not be denied that, when it has been determined to use instruments, the less formidable the procedure can be made to appear to the patient and her friends the better. Other things being equal, that plan should be adopted which can be gone about in the quietest manner. The position across the bed, however, is quite necessary if two or more fingers of the left hand are to be introduced into the vagina. When the perineum is relaxed the ostium vaginæ dilates, not from before backwards, but more nearly in the direction of a line drawn in continuation of the symphysis pubis. The twisting of the left wrist, therefore, would be extremely awkward if the body of the patient is not kept well forward.

With the plan I have followed, and would now advocate, the ordinary position does not require to be interfered with. The patient simply requires to be conveniently near the side of the bed. In very many cases it is a matter of indifference to myself whether she be lying on her back or on her side. If she is not under chloroform, and is anxious to facilitate procedure, I prefer a posture between the two. The right thigh can thus be more readily managed than when she is lying fairly on her side.



In regard to immediate management, we may take one of the simplest cases, where the head is at the outlet and the perineum is relaxed. An examination being made in the ordinary way with the right hand, the blade to be applied first—that is, in most cases, the lower or left iliac blade—is held in the left hand (which, as I have already said, is crossed over the right wrist), and the point directed to the margin of the outlet. If the perineum be well relaxed it will at once slide within the vagina, along the side or inner surface of the finger.

Or, allowing the middle finger to remain within or at the edge of the vagina, the forefinger is made to catch on the inner rim at the rounded end of the fenestrum, and to draw the point cautiously onwards. If the patient be stout and the perineum thick, a little care is necessary to prevent any fold of skin or mucous membrane being caught by the edge of the instrument. One or other of the fingers feels cautiously round while the point is being coaxed onwards; for, of course, through all the stages of introduction and adjustment any great amount of force is out of the question.

The more firm the perineum is, the more necessary is it for the handle of the instrument to be directed well forwards. If the outlet of the pelvis be contracted, the handle may with advantage be even inclined to some extent across the left thigh, so that it is made to describe a complete half-circle as the blade is being made to sweep round into its proper position on the head.

When the point of the instrument is fairly within the vagina, its progress and direction are at first to be trusted almost entirely *to the forefinger pushing on the rim of the fenestrum.* I believe those who have never tried this plan will be surprised to find how easily it can be urged onwards, and how safely the proper direction can be given.

Of course, the direction for the first blade is, as a rule, first backwards along the perineum towards the sacrum, and then downwards and forwards, so that the outer surface of the instrument is toward the left ilium; and for the second blade, it is first backwards and then upwards and forwards, so as to lodge it between the child's head and the right ilium.

As long as the rounded point of the instrument is within reach it is pushed onwards by the forefinger, and the left hand has scarcely anything more to do at this stage than to allow the handle to rotate, and to be elevated or depressed according to circumstances. When the finger has pushed it onwards as far as it can reach, the left hand becomes the propelling force. The forefinger, however, still acts at any convenient point as a fulcrum to assist in giving the proper direction to the blade, while the hand gives the rotating and forward movement. If the os uteri has previously been slipped over the child's occiput, there is usually no difficulty now in at once adjusting the blade to the proper position on the head.

In this process there is wonderfully little risk of any injury being done to either mother or child. Ramsbotham indeed remarks, that if "a circular sweep of a portion of the pelvis is made, the maternal structures might be endangered." But it is really difficult to conceive how such an accident could happen, except by the grossest carelessness. When the perineum is at all distended, the surface of the vagina is so smooth that it would be difficult, even intentionally, to make the edge of the instrument to catch on any fold of the mucous membrane. If the head is high in the pelvis the probability of doing so is still small, and may be avoided by the most ordinary care. I have applied the forceps in the way now described for twenty years, and have never met with any accident to the maternal passages by the sweep of the instrument. In regard to the progress of that part of the blade which is out of reach, the operator has first to have a clear conception of the direction he wishes it to take, and then to proceed with the caution, but, at the same time, with all the confidence that the surgeon has in passing the male catheter.

If the os uteri is still felt all round on the head, the *tactus eruditus* of the forefinger comes to be of great assistance. The instructions usually given to introduce the fingers of the left hand within the os, and to feel for the child's ear, appear to me to be not only needless but to be cruel to the patient, and indeed the attempt must often be difficult for the operator. The forefinger by itself, being intimate with the topography of the localities, can at once determine the position of the instrument relatively to the passages and the child's head. It not only takes up greatly less room, but it is positively more efficient. It is usually a very simple matter to introduce the point of the blade within the os, especially if the latter has been pushed low into the pelvis. When it is not easily reached, the method of procedure resembles what I have detailed for introducing the blade into the vagina. First, the finger tilts on the os, while the left hand cautiously advances the point of the blade till it rests on the child's head. Then the finger hooks itself into the fenestrum, and, if possible, keeps the point sliding along the scalp till it catches the lip of the os and is pushed within it. The part at which I prefer to enter the instrument within the uterus is, for both blades, at the posterior or sacral portion of the os uteri.

If the point has passed the os, and we are uncertain whether it is outside or within the lip, all that is necessary is to draw back the instrument slowly while the finger is resting on the os. If it be within the lip, it will be caught on the tip of the finger, and no hesitation need then be felt to urge it steadily onwards, and to give the necessary rotatory impulse to bring it into position.

It may sometimes be an advantage to be able to apply the forceps although the os uteri is not completely dilated, as in cases of severe convulsions, when uterine action is completely in abeyance, and the only hope for the mother is in the speedy termination of the labour. Now, in the manner I have described, the forceps may be passed into the uterus when the os is scarcely more dilated than just to admit the breadth of the blade. On this point, however, I shall not at present dilate, as I have brought it before the Society on a previous occasion.[1]

In regard to the introduction of the second blade, the same general management is to be attended to. Introduced in front of the first blade, it is directed backwards along the perineum, and then upwards and forwards towards the right ilium. Here, as before, if the head be low in the pelvis, no difficulty is experienced in introducing it within the vagina, and in adjusting it on the head. If the outlet is contracted, the handle may be inclined across the right thigh, at the first stage of introduction, and a complete half-circle be described in the adjustment. If the perineum is thick, or the patient stout and with sturdy muscular thighs, a convenient mode of introducing the second blade is to project the handle so well forward that the left hand can support it in front of the thighs. When the patient is lying on her back, it can thus be passed with great facility. The forefinger again acts as the propelling agent in the first stage; and, according to circumstances, it does so either behind or before the shank of the first blade.

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[1] Edin. Med. Journal, Oct. 1868.

There is one point which requires a little study in the process of adjusting the second blade. Very often, when it is being made to sweep round to its position on the head, the handle is apt to be caught on the mattress; and this may sometimes be to an extent to make it appear to be impossible for the sweep to be completed. Usually a little coaxing will overcome the difficulty, but if this is not sufficient, all that is necessary is to get the patient to lie a little more on her back, and the handle may then be made to go round without interruption.

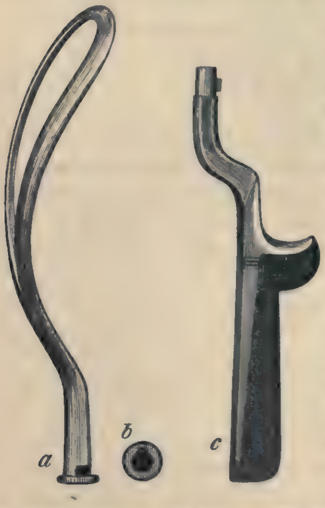
In regard to the locking of the blades I have nothing new to suggest. In most of the cases they lock readily with the first attempt. When they do not do so easily, an examination must be made to ascertain whether one of them cannot be better adjusted. I believe it will be found that if one of the blades inclines to fall easily out of position, that is the one which requires to be further introduced or rotated. It is seldom necessary altogether to withdraw either blade.

If the adjustment cannot be improved, some force may be employed to complete the act of locking. The shanks are brought into contact as near the lock as possible. Then each handle being held firmly, the one in the right and the other in the left hand, the thumbs are made to press steadily on the one side of the lock, and the forefingers firmly to support the anterior shank on the other side. The point of contact is the fulcrum, against which each handle, as a lever, is made to press from opposite directions. Considerable force can thus be applied, especially if the handles have transverse rests below the lock. Of course, the hands are ready to complete the locking as soon as the twisting or compression is sufficiently acomplished.

This paper might be considerably extended by considering what may be done in particular contingencies, but this is unnecessary. I wish my remarks to be taken as hints rather than elaborate details. I believe, indeed, it would be impossible to lay down rules that must apply to all the cases that one meets with in practice. A great deal must be left to the common sense of the practitioner in adapting general instructions to the peculiarities of individual cases. Where there is pelvic deformity, or mal-position of the head, or strongly developed pelvic ligaments, more depends on the mode of traction and general management than on the mere act of introducing the blades; but these are points on which I do not enter in the present communication.

Note on Modification of the Midwifery Forceps.

A few years ago[1] I showed an instrument at this Society, intended to be such a modification of the long forceps, that the shank being cut at the middle, a joint was contrived by which the pieces could with facility be joined or detached. The Simpson forceps could thus be made as portable as the common short forceps. In contriving the joint, there was a rather intricate mechanism of spring and catch, to prevent the pieces becoming too readily disjoined. After some experience, however, I have discarded this mechanism as quite unnecessary, and for several years have found the simple instrument, which I now show to the Society, to answer admirably.



The two portions are joined by what is known as the bayonet joint. On the blade portion, *a*, there is a socket, in the rim of which is a notch, *b*, which leads to a horizontal slit extending about one-third round the circumference of the socket. On the handle portion, *c*, is a nipple which fits into the socket, and on it there is a small knob which enters at the notch. When the nipple is fairly inserted, and a quarter turn is given to the handle, the knob slides along the horizontal slit, and the blade and handle portions have then exactly the same relations to one another that they have in the solid instrument.

In making the socket, it is very necessary to attend to the direction of the slit. In both blades the notch for receiving the knob of the nipple is opposite the concave *edge* of the blade, and the slit itself terminates opposite the concave *side*. It will then be found that, with either blade, the rotation necessary to join the pieces is in the same direction as the rotatory movement that must be given when the blade is to be adjusted to its position on the head.

On looking at the instrument as held in the hand, I dare say the first impression may be that the joints are insecure, as the tips of the blades appear to fall readily inwards. But it is to be remembered that in practical use the child's head is between the blades, and when they are locked the whole instrument is as immobile as the solid-stemmed long forceps. It is then an impossibility for either handle to slip away from its blade portion. The whole of the strain in compression and traction is thrown on the solid part of the socket.

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[1] Edin. Med. Journal, Dec. 1862.

In using the instrument, I first introduce and adjust the blades, and then join the handles. Sometimes, however, as when the head is at the brim of the pelvis, I may join the handle on the second or upper blade, to assist in the rotation necessary to place it in position on the head. I do not find that the blade, when once adjusted, tends to slip out of its place more readily than that of the ordinary instrument. After introducing the first blade, I have purposely left it alone for some minutes without finding it displaced. Indeed, one would naturally expect that the absence of the weight of the handle would be rather an advantage in this respect.

The act of joining the handles is a very simple process. The notch in the rim of the socket being felt for, the nipple is introduced with the knob opposite the notch. When fairly inserted, the handle of the lower blade is turned upwards, and that of the upper blade is turned downwards. The instrument now resembles the ordinary forceps, and locking is made in the usual way; of course, care is to be taken that the shank of the upper blade is in front of that of the lower when the handles are joined.

As, in my former paper, I narrated some cases to illustrate the advantages of this modification of the midwifery forceps, I shall not now detain the Society by further remarks. I may only mention that, after other nine years' practice, I have never experienced any serious difficulty in regard to the speculative objections that were urged against the instrument.

ARTICLE V.—*On Mining Exhalations.* By JOHN BOYD, M.D., Slamannan.

In coal-mining, the first step is to sink a shaft down to the coal measures, at whatever depth they may lie. This operation consists in excavating a vertical pit, generally 12 feet by 9. When sunk through the various superjacent metals to the depth of from 20 to 100 or more fathoms, a large amount of *débris* is necessarily accumulated, and usually laid down in the immediate vicinity of the pit mouth, unless when, as sometimes happens, it is utilized in forming the branch to the main railway, access to which is essential to successful prosecution of this important line of industry. When the shaft has been sunk, and the above-ground machinery erected, the next proceeding usually is the building of cottages for the engine-keeper and pit-headman; sometimes a row of miners' houses are strung on to these, and the huge mound hems in a busy and populous neighbourhood. This *dirt-hill*, as it is termed, is composed mainly of the clay; then the freestone, and the various slaty, calcareous, and shaly strata which are met before the coal is reached; and the lower minerals are naturally spread on its upper surface, which is redolent of the gaseous emanations which pervade the workings below. Ferruginous and sulphurous salts are abundant. In warm moist weather, I have frequently thought I detected the characteristic evil odour of decomposing eggs in the atmosphere of such accumulations. At all events, when a dirt-hill is burning, the blue flame of generating sulphurous acid is discernible enough, and the red *blaize* which results from such incandescence testifies clearly to the presence of iron in the silicates.

For a considerable number of years back, I have been struck with the extra amount of sickness of an asthenic and zymotic type, which occurred in the clusters of houses in the immediate neighbourhood of the mounds in question. The true test of the sanitary state of any inhabited spot is the condition of the females and children who reside there, as these are more permanently exposed to whatever malarious influences may be in operation on their habitat. The number of cases of female and infantile sickness that arose within a score or two of yards from a dirt-hill, have certainly been much above the average of this cool and bracing district; and the difficulty of conducting such cases to a favourable conclusion has, in my experience, been unusually great. What first attracted my attention fourteen years ago to this subject was, the circumstances of three cases of slow obscure abdominal inflammations originating in two adjoining cottages lying north and east of a large dirt-hill two miles distant from this, and, from their situation, exposed fully nine months a year to the prevailing south-west breeze blowing over this mound, carrying its exhalations directly into them. The first, a large well-developed woman about thirty, some weeks after being confined of her second child, took a lingering attack of abdominal tenderness, feverishness, and debility, which culminated in an extensive abscess in the anterior interspaces of the muscles of the abdominal walls, and she never fully regained her health till she left the dwelling. Her successor in the same abode was affected with a sub-acute attack of metritis, which did not subside till she likewise left. The year following, a young married female of eighteen, who lived next door, had a miscarriage at the sixth month, followed by extensive pelvic cellulitis and peritonitis, terminating in a suppuration so extensive that one evening it burst at the umbilicus, and left her in a bath of pus. I measured about 30 ounces, besides what soaked into the bed. The distended abdomen contracted somewhat, and the pulse fell, but some ounces of pus continued daily to exude. At the end of six weeks she removed to another district, and died exhausted two months afterwards. The succeeding tenants have all had a lowered tone of health. One has had several abortions, and the children there have been reared with more than average difficulty, subject to all prevalent epidemics, especially scarlatina. This malady has carried off several children in another pair of cottages precisely similarly situated, two miles to the south of this; and the pale and sickly aspect of maternal parents, ruddy enough in other dwellings, distinctly indicated that some unwholesome influence was continuously at work on their systems. Half a mile east of the latter there were five houses very close to one of the largest dirt-hills, where I have seen young people who were but slightly strumous when they arrived, become subsequently affected with hip-joint disease, caries of the tarsus, phthisis, intractable sequelæ of scarlatina, and general marasmus. A little further on, a good-sized mining village, situated at the bottom of an acclivity rising to the south, where the dirt-hill was correspondingly extensive in scale, furnished for a long time the most varied and arduous practice, especially among the young: croup was frequent, and generally fatal. Dysenteric affections, severe and obstinate scarlatina and measles, carried off a much larger percentage than in any other part of the parish; while very few of the mothers presented the normal, buxom, well-fed aspect that usually contrasts so strongly with that of their male relatives who toil under ground. Some years ago the dirt-hill was removed, buried in the adjoining hollows, and soiled over. Since then the village referred to has become decidedly improved in a sanitary point of view—cases fewer and more amenable to treatment, because more sthenic in character. About a league hence, in another direction, there are two mining hamlets very close to each other, and both lying on the northern edge of an extensive tract of moss. The furthest cluster of houses is slightly above the moss level, the other 12 or 15 feet below it, but the latter has an open pit and a large dirt-hill towering over it to the south-west. The female inhabitants of the former are obviously superior as regards freshness of complexion and appearance of physical vigour, and, so far as I can learn, have no special ailments to complain of. The other collection of brick-built edifices has been little other than an hospital ever since it was erected, and those that throve well enough elsewhere became anæmic, listless, and dispirited there. In the males, in such localities, Decaisne's disease from time to time proclaims the cravings of nature for some such external consolation as can be inhaled from a tobacco-pipe; and the consumption of alcohol under such circumstances is not always squared by the rules of moderation.

With regard to the special nature of the gaseous emanations which are so evidently unfavourable to the health of those living in their vicinity, it is probable that sulphuretted hydrogen plays a conspicuous rôle; but others are also present. The same mineral elements and combinations indubitably exist in the upper surfaces of these chaotic heaps that gave rise to the more or less contaminated atmosphere of the workings below.[1]

[1] Fresenius, Lehrbuch der Chemie, Erste abtheilung, § 64, bl. 97, says, "Der

Although there may be economical reasons to be urged for building habitations so near to such accumulations, and more especially the frequent convenience of the engine-keeper's abode being close to the pit, when the brushers are at work, so that during the night he may be easily signalled by the bell when the the cage is wanted to be raised; yet such considerations are, when rightly viewed, of little weight when compared with the conservancy of the only real capital of the workmen and their families—their health and strength. I am very certain that coal-masters in general only require the matter now discussed to be fairly brought under their notice to induce them to remedy arrangements so unwholesome and objectionable.

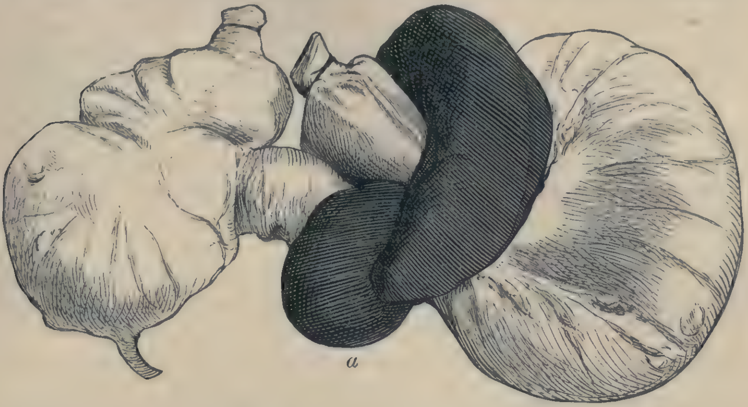
ARTICLE VI.—*Intestinal Obstruction from a Knot on the Lower Part of the Ileum.* By MICHAEL W. TAYLOR, M.D., Penrith.

(*Communicated to the Medico-Chirurgical Society of Edinburgh, 7th June.*)

THE cast which I send for exhibition to your Society affords an accurate representation of the pathological condition, appearances, and colouring of the parts, and was taken from the recent preparation, obtained at the autopsy eight hours after death, 1st December 1870. The result of the post-mortem may be described shortly as follows:—Body plump, fat; great distention of abdomen, and drum-like resonance. Peritoneum smooth, without inflammatory appearances or products. Small intestines distended, concealing from view all other organs; their parietes thin, without rupture, and not remarkably changed in colour until approaching the right iliac region, where a livid mass of strangulated bowel indicated the site of obstruction. About 2 inches above the cæcum, a portion of the ileum about 22 inches in length was found coiled and involved upon itself so as to form a running knot. It must have taken place in this wise: About 12 or 15 inches of the lowest part of the ileum must have become coiled in a circular loop; the portion of intestine directly above must have twined round from behind to the front of this coil; a knuckle, or rather elbow, of this portion of the bowel must then have slipped through the loop, and, becoming embraced by it, on the tightening of the noose, must have been caught in a slip-knot, or the same kind of knot as that by which sailors hang their necktie. On looking at the cast, the distal or cæcal end of the ileum may be seen to form the knot, and the intestine superior to it constitutes the included *cul de sac;* this included portion, *b*, is bulged out in a globose form, with a semilunar outline like a bag or pouch, measuring 5 inches by 3, and showing on its surface the markings of six or eight sacculi or folds. It is drawn

artige stinkende Luft enthält nicht allein einen vermehrten Gehalt an Kohlensäure, sondern auch Kohlenwasserstoff, Schwefelwasserstoff, und Phosphorwasserstoffgas, ferner kohlensaures Ammonium oxyd und Schwefelammonium. So verdorbene Luft findet sich ferner in Kohlenbergwerken, woselbst der Luft sich öfters Kohlenwasserstorff beimengt," u. s. w.

into puckers at the neck, and the little finger could be passed freely under the point of constriction there. The colour may be noticed to be heightened, but without lividity, and it was not immoderately



distended. The point of greatest constriction was at the lowest part of the knotted portion, *a*, near the ileo-cæcal junction, where the involved intestine was in one part of a dark brick-dust or brown colour, and in another coil of a livid purple, and in parts black, soft, and gangrenous. Below the knot the distention and dark colour terminated abruptly; the cæcum and colon, white and collapsed; gall-bladder full, and stomach healthy; no disease elsewhere.

The illness existed fourteen days, and the subject was under observation during all that period. She was a strong, healthy, married woman, aged 40. Symptoms commenced suddenly with tormina, vomiting, pain on left side, constipated bowels. Fæcal vomiting on third day; absence of inflammatory symptoms throughout; no high tenderness nor distention until towards the termination; continuance of retchings, but subsidence of stercoraceous appearances, until their recurrence three days before death. Two or three times during the illness, passage of fluid fæces in small quantity, and the repeated voidance of flatus. Diagnosis, from exploratory injections, etc., was obstruction at a point above the cæcum.[1]

The disclosure of the pathological cause attaches to this case of ileus an interest and importance, as it affords a perfect example of an intestinal lesion of the extremest degree of rarity, viz., true knotting of the bowel. Amongst the various causes of intestinal obstruction seated in the bowel itself is volvulus. The cases referable to this head may be arranged in two subdivisions, viz.—(*a*) Twists or folds of the intestine on its own axis; (*b*) Twists around another piece of bowel, or knots. Volvulus, even strictly in its generic sense, as including both these two forms of entanglement, is a comparatively unfrequent cause of ileus; and species (*b*), or knotting of the bowel, I find to have been exceedingly rarely recorded. One instance is related by W. Gruber in 1863. One very similar to the present case is given by Duchaussoy in his elaborate résumé of 518 cases of intestinal obstruction, published in 1860. Dr Hilton Fagge has given records of 54 cases of ileus in which autopsies were made in Guy's Hospital for fifteen years,—in 7 instances, volvulus or twists were found, but in none of them knots. In the British medical periodical literature of the last half-century, cases arising from twisting of the bowel on its own axis are given by Abercrombie, Oudney, and one or two others, but I find no case of true knotting recorded.

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[1] A full account of the case may be found in the British Medical Journal, 29th July 1871.

In the present case, after gastrotomy, the disentanglement of the knot would have been quite feasible.

ARTICLE VII.—*The Normal Products of Hepatic Action.* By Dr JOHN G. MACVICAR, Moffat.

PART I.—GLYCOGENIC AND FATTY MATTERS.

THE hepatic action, according to a communication made in this Journal for August 1868, has for its principal function to prevent the reconstruction of vegetable along with animal matter out of the digested food in the portal blood when depositing tissue, and thus to preserve the newly-formed animal cells free from that incrustation of cellulose which exists in the new-born cell or primary utricle of the vegetable kingdom—an incrustation which, however valuable in that kingdom, imparting, as it does, durability to the plant-tissue or tree, would, if present in the animal kingdom, prevent that mobility and easy transformability of tissue which is essential to animal life. In a word, the view there given is to the effect that the hepatic function is emphatically that which maintains the difference between animal and vegetable substance—securing the continued reproduction of the former and the avoidance of the latter, under an otherwise inevitable morphological liability to lapse into it.

As a plant which has completed its growth, and is ripening its seeds, no longer continues to form cellulose, but disposes of the nutritive matter which continues still to flow into it, as sugar, oil, essence, resin, colouring matter, etc., in the same way, it is maintained in the communication referred to, the liver, like a fully-developed plant or tree (already crowded with succulent leaves), disposes of that part of the inflowing plastic matter which would otherwise have disposed of itself as cellulose, as sugar, oil, bile, etc., instead; whence it comes to pass that cellulose in the animal kingdom occurs normally only in such animals as are very low in the scale—

only indeed where it is needed to give support or permanence to their otherwise too soft bodies; or if in the higher animals, then only abnormally in states of disease (amylaceous degeneration), when the hepatic action is not performing its function successfully.

According to that theory of the method of creation, indeed, which now begins to be popular—namely, the secular development of new and more highly organized animal species out of more ancient and simple ones—the limitation of hepatic action may serve another important purpose in the economy of nature. It may serve to preserve from a more speedy ascent in the animal kingdom those species in which, through the failing of the hepatic action, phyto-cellulose is abundantly deposited. Thus, while the most advanced advocates of this theory are disposed to regard certain *larvæ* among the tunicata as the ancestors of the whole vertebrata, we might explain the permanence of the *mature forms* of ascidians in nature to this day by the abundance of their cellulose, which retards their transformation; and so of many other orders of the invertebrata. But it seems to me to be building without a foundation, when men of science speculate on such a subject, and are yet both ignorant, and content to remain ignorant, as to whether there be two atoms of hydrogen, or only one, in an element of aqueous matter; or three atoms of oxygen, or only two, in an element of silica.

The theory of hepatic action now advanced, if accepted, has the advantage of accounting for a hepatic function and apparatus to the extent that it is met with in the animal kingdom, which, down to the present, has still remained among the desiderata of physiology. And if it admit of verification, it is surely worthy of it at the hands of such physiologists as pursue that study in a rational, and not a merely empirical, way. It does indeed take for granted that the characteristic material of plant-tissue (which, to save continually repeated definitions, we may call phyto-cellulose) is of easier construction than animal-tissue (which, for a similar reason, we may call zoo-cellulose). It assumes that, given a quantity of living germinal matter, having such a history as that in the portal blood, especially if it have previously existed as vegetable matter, it will, during the epoch which follows that of digestion or analysis—the epoch, namely, of reconstruction or synthesis—tend to form into phyto-cellulose rather than into zoo-cellulose; or, at any rate, to give the former as an incrustation upon the latter unless it be prevented. Now the demonstration of this, it must be admitted, cannot be given here, any more than that of one of the later propositions in Euclid's Elements without those which go before it having been first given. It merely presents itself in its own place in the new science of Molecular Morphology, and is demonstrable only to the few who have made a study of that new science. At the same time, independently of such demonstration, and on general chemical grounds, it ought to commend itself to men of science, because it is generally known that phyto-cellulose requires as material for its construction only carbon and moisture, which abound everywhere; while zoo-cellulose not only requires these elements, but ammonia also, which is both a comparatively scarce substance in nature, and of such difficult construction out of its elements, that the chemist can scarcely accomplish it except in a roundabout way.

In the Molecular Morphology referred to, it comes out that the nucleus, or rather the axis of the least element of phyto-cellulose, is an atom of *common vapour*, fixed by three atoms of carbon placed symmetrically around it; while the corresponding part in the least element of zoo-cellulose is an atom of *ammoniacal vapour* fixed by six atoms of carbon.[1] But in these things, of course, I do not insist here. Nor is a belief in them necessary to our progress, nor to the acceptance of what follows.

It is proposed in this communication to verify the theory of the hepatic function which has been stated, by showing that the hepatic products are in the highest degree analogous in structure to the vegetable products which have been already referred to, and which substitute cellulose in the ripe fruit and the full-grown plant or tree.

A more general object also is to give the structures and formulæ of the normal hepatic products, so far as they can be determined at present independently of any theory, and that as the first step necessary towards a true knowledge of the hepatic pathology, which I leave to others and the future.

And here, since it adds so much to clearness and distinctness of conception, let us have recourse to diagrams representing our molecular structures, so far as the types already in the hands of printers and a single plane surface such as that of the page (instead of space in three dimensions) will allow, which is not far. And let us take the same symbols as were taken in this Journal (for March 1870) in a paper on Urea and Uric Acid, modifying that for ammoniacal vapour, however, which is a dimorphous element, isamorphous in one of its forms, with a couple of atoms of common vapour on the same axis, bolted together by an atom of hydrogen, which stands concealed in the axis between them. For—

Substances.	Symbols.	Their meaning.
Hydrogen, . .	$\mid$	A dash (say a figure 1, the atomic weight of hydrogen on the common scale).
Active Oxygen, .	∞	A figure 8, usually in a horizontal position, the atomic weight of a single atom of oxygen, the atoms in the aeriform state always going in couples.
Oxgen gas, . .	$\begin{matrix}\infty\\\infty\end{matrix}$	
Carbon, . . .	0	A cipher, usually in a horizontal position, its atomic weight = 6 when H = 1. Carbons also tend to go in couples, atomic weight = 12.
Coupled carbon, .	$\begin{matrix}0\\0\end{matrix}$	

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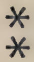
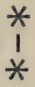
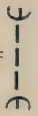
[1] See A Sketch of a Philosophy, Part III. The Chemistry of Natural Substances, Chap. ix. The Tissue Element. Williams & Norgate, 1870.

Substances.	Symbols.	Their meaning.
Zote, . .	or	Azote, a coupled atom, the single atom named zote not insulable by itself, and therefore not a laboratory substance, but intensely active.
Azote, . .		
Aqueous matter,	✳ =	A star of 6 rays, its literal symbol Aq, transformable into HO, and eminently dimorphous.
Ammonia,	 or  = 	Dimorphous, and giving, on decomposition, + III = Az H_3.

Glycogen, Dextrine, Sugars, Inosite, Glycerine, Glycocoll, etc.

And now as to those products of the hepatic action to which we shall first direct our attention, it is desirable to fix upon glycogenic or saccharine matter, and oil or fat. Not that those are the most characteristic products of the liver; but the former lies so completely at the basis of all vegetation, and indeed all organic chemistry, that the student cannot proceed with advantage in any direction if in ignorance of the structure of an element of saccharine matter; while with regard to oils and fats, they are so constantly associated with saccharine matter as its ultimate representatives when the latter has yielded up the most of its oxygen to the atmosphere again, that it is best to take the two in connexion.

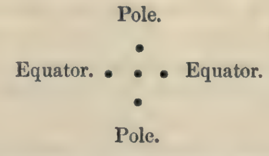
Nor let it be thought that either is of small importance in the economy of nature. Molecular morphology shows that the most central part of the albumenoid or proteine molecule—that which (1) would remain if that molecule were to rot or dissolve away from the periphery inwards, and consequently that also which would (2) be required as a nucleus if an albumenoid or proteine molecule were going to be constructed, and that which (3) must remain in the blood and go out in the urine if the constructive power of the body be failing—is a group of atoms represented by the formula $C_{12} H_{12} O_{12}$, or, if dried in the laboratory, $C_{12} H_{10} O_{10}$, in short, a molecule, which, to use for it the most comprehensive term, we may call glycogen. As to fatty matter, again, it may be shown that, while it is of great value after undergoing digestion by the action of oxygen for constructing the carbo-hydrous part of the tissue element, it is precisely the material out of which the non-aqueous part of the neuro-cerebral apparatus is mainly constructed, being provided by nature (like other kinds of food) for this purpose, by the vegetable kingdom and the hepatic action. That it should be produced in greater quantities than are required for these purposes, and of kinds that cannot be utilized in this way, is only what is constantly occurring in the richness and variety of nature. Besides, are we to forget its use as fuel to be burned by the oxygen of the atmosphere, brought into contact with it by respiration, on which so much stress is laid in modern physiology? Beautiful, surely, that the excess, or what is not fit for the primary use, should be thus got clean out of the system; especially if, at the same time, by raising the temperature of the organization above that of the ambient atmosphere, it does more good than harm. But to advocate mere burning as the principal end for which existence has been awarded or permitted to this, or any order of concrete substances, is to advocate one of those views (so prevalent in modern science) which, in consequence of their want of comprehensiveness, have gone far to bring the grand and truly philosophical doctrine of final causes into disrepute.

The types used as symbols, which have been already adduced, will serve our purpose generally. But so much in all organic chemistry, and especially in most of the substances which we have in prospect, turns upon the structure of hydrogen, that it is desirable—almost necessary, indeed—here to define the structure of this element more particularly.

Let us then, according to our views, (1) affirm that there is a unit of weight or element of material substance which is common to all the chemical elements or indecomposable substances, each chemical atom consisting of a group of these material units, their number in the atom being its true atomic weight; and (2) that hydrogen is that chemical element of which the constitutive number of material units is the smallest that can give a structure which possesses symmetry, stability, and individuality when moving about among others—that is, a structure which has an axis and an equator evenly balanced between its two poles. These conditions imply five material units as the material of construction; two to form poles or terminals of an axis; and three to define a plane or equator evenly balanced between these poles, for no number less than three can determine any plane. It may be added, however, that this group of five material elements or centres of force is rather the nucleus of the atom of hydrogen than the whole of it; for these five material units, while they exist near each other, balanced *in equilibrio* by their mutual attractions and repulsions, are invested and surrounded to an unknown extent by their five atmospheres of æther, now confluent into one which envelops them as merely its nucleus.

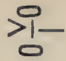
Of the nucleus of the atom of hydrogen, the following diagram may serve as a memorial:—

Hydrogen.



Atomic weight = 5.

Hence hydrogen may enter into union symmetrically with other elements, so as to give insulable and separable substances by receiving either (1) one atom on each pole, or (2) three atoms on its equator, or (3) both. And this much of its structure it was necessary to adduce in order to explain the ratios with which a single atom of hydrogen is found united in a multitude of substances which are the products of nature or the laboratory. Thus a very stable and generally diffused substance in nature is marsh gas, its formula ($C = 6$) being $C_2 H_4$; and a very interesting substance in the laboratory is chloroform, its formula $C_2 HCl_3$. Now interpreting both formulæ in the light of molecular philosophy, we see with the mind's eye a structure of which the axis in both is an atom of hydrogen carrying an atom of carbon on each pole; and on the three points, for union, on its equator carrying three atoms of hydrogen in the case of the marsh gas, and these substituted by three atoms of chlorine in the chloroform. The formula we may thus express in our symbols:—

Marsh gas, . . .  = $C_2 H_4$

$$>\overset{\circ}{\underset{\circ}{|}}-\ = C_2 H_4$$

But of these things hereafter. At first we have to do with still simpler combinations, even the simplest of all—that, namely, which results when an element of moisture and an atom of carbon enter into union with one another.

And here, unfortunately for us, we have to revert to a state of chemical theory which is no longer popular in this country. Thus, it used to be concluded from the experiments that, as all common vapour consists of one part by weight of hydrogen and eight of oxygen, and its specific gravity in the aeriform state was nine on the same scale, so the least particle of it should be represented by the literal formula HO, implying an atom of each element, the atomic weight of $H = 1$, and that of $O = 8$. More lately, however, it has been observed that oxygen does not move about freely, nor does it occupy the same volume as hydrogen in the aeriform state in weights of 8, but in portions weighing double this, that is 16. Hence it has been maintained of late that this latter number is the atomic weight of an atom of oxygen, and that the formula of the least particle of common vapour is—

$$H_2 O = 2HO.$$

For the same reason, it has been concluded that the weight of an atom of carbon is not 6 as it was long held to be, but 12. And this doubling of the two primary and all-important elements has necessitated the doubling and taking doubles for singles of a great many more. The fallacy took its rise in neglecting the law of symmetry, which usually requires that all such light elements shall go and come, enter and leave, molecules in couples. But just because it is a homage to the law of symmetry, these double-weighted atoms and their formulæ, when corrected, are often to be preferred to the older formulæ, since they give whole instead of half molecules.

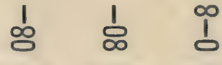
But to come into contact with molecular nature in her least particles, it is necessary to regard a single atom of oxygen as weighing 8, and a single atom of carbon as weighing 6, when a single atom of hydrogen weighs 1. Not but both oxygen and carbon tend to move and remain at rest in couples, the coupled units having therefore the atomic weights of 16 and of 12. But these elements are also found in action as single atoms; and thus we have, as the simplest and most elemental,

Hydrate of carbon, . . . CHO,

in which the letters are written in the order usual with chemists—an order which has no higher claims or pretensions than this, that when thus written the letters follow each other as in the alphabet!

But by adopting our symbols, we immediately obtain a somewhat clear and distinct conception of such a combination.

And first of all we see that, as it consists of three members, so it may possess one or other of three different structures and forms. And these keeping the aeriform elements always above the fixed element on the paper, we may thus represent CHO in diagrams, as also in corresponding letters; the diagrams being supposed to be read from the bottom upwards—

Hydrate of carbon,  Trimorphous.

COH OCH CHO

Farther, we see that in none of its forms can this structure be symmetrical so as to possess two poles which are similar to each other, and an equator lying evenly between them. In virtue of the heat or other force, therefore, which actuates it in common with every material structure whatsoever—that is, the palpitation, rotation, etc. of it, either in parts or in whole, it cannot remain *in equilibrio* isolating itself in space, but must ever tend to move hither or thither until it has fallen in with other structures, and sufficiently symmetrized its action by union with them. More shortly, and without attempting to give here the mechanism by which chemical activity and affinity exist and act, it is enough to say here that being unsymmetrical, CHO is uninsulable. And such elements of hydrate of carbon, when constructed in the neighbourhood of each other, must tend to run together into groups or molecules. No substance, therefore, will be separable and cognisable in the laboratory whose formula is merely CHO. But everywhere that there is organic concretion or growth, especially among its first beginnings, we may obviously expect $C_n H_n O_n$, and ultimately $C_x H_y O_z$.

The question is as to the value of n. Now to this molecular morphology gives a definite answer. The form of the atom of carbon, as also that of oxygen (and, indeed of the elements generally), is pentagonal. That of hydrogen, as has been shown (also sulphur, selenium, and tellurium), is trigonal. Hence, when a group of atoms of hydrate of carbon aggregate around a common centre to form a symmetrical and insulable molecule, the number which must concur, and go to constitute the molecule, is determined. Thus, geometry shows that for pentagonal forms to concur symmetrically and completely in this way, precisely 12 are required, and the form resulting is one of the Platonic bodies, namely, the dodecahedron. For trigonal forms so to concur, on the other hand, 20 are required, and then there results another of the Platonic bodies—viz., the icosahedron. When, therefore, in a molecule of hydrate of carbon, the atom of C or of O is centrad, the multiple $n = 12$; when the atom of H is centrad, $n = 20$.

And here I may remark, in passing, that without any appeal to the special determinations of our molecular morphology, and simply on the hypotheses that the atoms of bodies overhead are spherical, and that those of the same kind are also of the same size, when placing them symmetrically around a common centre so that the group may be as symmetrical—that is, as spherical—as possible, the same numbers 12 and 20 are obtained!

But whether shall we adopt 12 or 20 as the number of atoms of CHO in our molecule? To this it is to be answered, that H is always so eager to be off, compared with O, and especially compared with C, that in all ordinary cases we must allow H a place on the periphery of molecule. We obtain, therefore, as our insulable

Molecule of hydrate of carbon, . . $C_{12} H_{12} O_{12}$.

Such then is the number of atoms in our smallest saccharine molecule, when that molecule is monometric, or most spherical and perfect in form; and when, consequently, its activity has most successfully accomplished its end; and when, therefore, its remaining activity is a minimum—more shortly, when it is most inactive or reposing. And such, it is well known, is the formula of that which has been called inactive or neutral sugar.

But in such cases the law of differentiation often comes into play; that law, namely, by which a structure is saved from explosion or solution, and is enabled to survive an ordeal as a concrete, by making some part of itself dissimilar to some other part. This law has hitherto indeed been recognised in physiology only, applied to the development and maintenence of organisms only. But in these it is only a particular display of the universal principle of dissimilarity in two or more parts or particles, as the condition of union, both initial and sustained. The embryo gains as a concrete upon the liquid in the midst of which it develops, and is enabled to survive the ordeal of the solvent power of that liquid by its own differentiation. And the same phenomenon comes into play everywhere as soon as there is chemical action and a molecule produced.

When it takes effect upon an isometrical molecule with 6 equal axes, and of this $C_{12} H_{12} O_{12}$ is a formula, it usually does so by giving eminence to some one axis of the six, either by addition or subtraction of the same matter from both extremities or poles. Now in this case, without disturbing the fixed nucleus of C_{12}, this may easily be done by the subtraction or addition of a particle of moisture on each pole. Hence, along with that which we have found already, we may expect two other sugars, all three being—

1. The isometrical molecule, . . $C_{12} H_{12} O_{12}$
2. Differentiated by subtraction, . $C_{12} H_{10} O_{10}$ *
3. Differentiated by addition, . $C_{12} H_{14} O_{14}$

Now such are the formulæ of the three most eminent saccharine substances.

It is well known, however, that the chemical method of investigation (weighing the substances when in combination with another substance whose weight is known, followed by destructive analysis) gives these three as the formulæ, not of three substances only, but more nearly of thirty. There is manifestly therefore some secret about the molecules, which these formulæ stand for, which experimental chemistry cannot explain. The same formula manifestly stands for many molecules differing notably from each other, both in their physical and chemical properties.

Well, then, let us see whether molecular morphology does not unfold this secret in a perfectly satisfactory manner, and bring us into acquaintance with the forms and structures of the molecules, which the chemical formulæ do indeed affirm, yet leave in concealment.

It has been shown that the simple saccharine element, CHO, is trimorphous. Suppose, then, these trimorphous elements to be aggregated together in a group of 12, with nothing to limit their permutations but the law of symmetry, acting in company with the law of differentiation, which demands a play and a variation of form between the polar and the equatorial parts of the molecule—how many dissimilarly constructed molecules, possessing dissimilar properties, may we not have, all of which the same formula $C_{12} H_{12} O_{12}$ will equally cover? Whatever that number may be, a still greater number will $C_{12} H_{14} O_{14}$ cover; and even $C_{12} H_{10} O_{10}$, in which the poles are fixed, naked, and invariable, may cover three.

Something of the variety and richness of nature, at all events in this respect, as in all others, the following diagrams may assist in explaining. They are as it were profiles of the dodecahedral molecule, or more shortly the dodecatom, composed of CHO, and show half the number of elements of which it consists.

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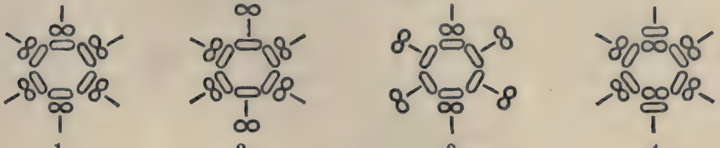
* How the formula of cane-sugar comes to be $C_{12} H_{11} O_{11}$, I have elsewhere shown. See A Sketch of a Philosphy, part ii. p. 72: Williams & Norgate.

Inactive Sugars, etc.



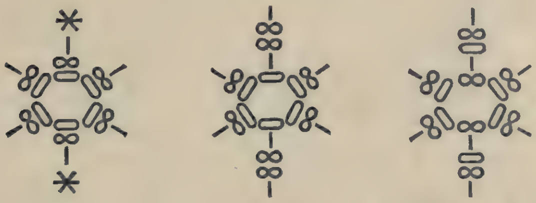
1. 2. 3. 4.

$C_{12}\ H_{12}\ O_{12}$

There are several others also. Moreover, except the first, all are differentiated in structure, though continuing isometrical in form! They will all therefore be more or less stable in the regions of nature in which they are produced, as also in the laboratory of the chemist. And thus they may possibly be detected and described by him. If the series had been continued, No. 5 would have resembled No. 3, only that the position of C and O in the poles would be inverted; and so on.

The molecule which is differentiated by the addition of an atom of moisture on each pole will give the same series increased by several additional members, as for instance the following, in which the body of the molecule remains the same in all.

Fruit Sugars, etc.



1. 2. 3.

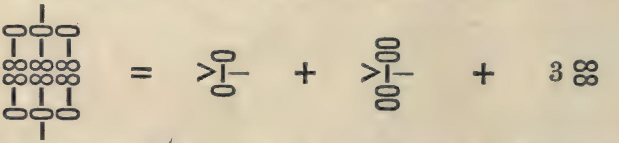
$C_{12}\ H_{14}\ O_{14}$

In No. 1 the molecule carries an atom of aq. (common vapour) attached to each pole. In No. 2 that atom of aq. is transformed into HO (the acid or basic state of moisture, according as the atom of H or of O is terminal of the axis of the molecule and presents itself for union). The aqueous matter in the pole of No. 2 is therefore, according to the fashionable notation, H_2O; and if that aqueous matter went off, or were drawn off, there would remain a molecule with the very frequently recurring formula $C_{12}\ H_{10}\ O_{10}$. In No. 3 each pole is a saccharine, viz., CHO. But here, as in No. 4 of the first group of diagrams, there is a liability of an atom of C on each pole to go off with H or HO, and so to reduce the carbon in the nucleus to C_{10}, and to give a start to a new series of substances.

But not yet to part with syrupy and saccharine substances, it may be shown that when saccharine elements of CHO are set loose along with nascent hydrogen, three of the former are apt to attach themselves to the three regions for union on the equator of the atom of hydrogen. Moreover, the combination thus constructed (each being very oblate in form) must tend to couple and go off in couples, as atoms of oxygen and of carbon, etc., which are also oblate, tend to do. Such a structure it is unfortunately difficult to represent on the plane of the paper as we have done the others. Perhaps some idea of its most symmetrical structure might be given by supposing the axis to be horizontal, and writing the formula thus :—

$$\text{Glycerine} = \quad H \begin{matrix} (CHOOHC)^3 \\ (CHOOHC)_3 \end{matrix} H \quad = C_6\ H_8\ O_6$$

Giving all its constituent elements reduced to the same plane, and in the state in which the axes of all are parallel, we obtain—



Glycerine, = Marsh gas + Olefiant gas + Oxygen gas,

a very interesting structure, full of the promise of resolving itself more readily than sugars in general into oxygen gas (which is in fact already constructed within it) and olefiant matter, and light hydro-carbon, thus :—

1. Marsh gas, . .	C_2	H_4	
2. Olefiant gas, . .	C_4	H_4	
3. Oxygen gas, . .			O_6
Glycerine, . .	C_6	H_8	O_6

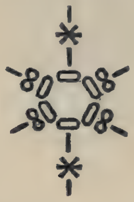
But such a structure is still far from having attained one of stability and repose. Each atom of it may be said to be a case packed full of oxygen gas, hydrogen, and hydro-carbon, needing only a change of form and a further supply of oxygen to go wholly off into the aeriform state with explosion.

But, in aiming, as every molecule structure does, at a greater degree of symmetry or sphericity, and therefore of stability or repose, such structures may, and generally do, double. And what do we now obtain? Plainly a completed syrup molecule resembling most closely that of fruit-sugar, but with this difference, that the terminal atoms of moisture are not now free to go off on the application of heat. They have now an atom of H half-occluded in each pole, which also belonged to the molecule during its genesis, and which, therefore, will be difficult to be expelled. Hence, for the entire molecule a remarkable degree of stability.

If, in fact, the polar form in this syrup — that is, an atom of vapour with an atom of hydrogen in each pole—could possibly be obtained free from carbon (which is the sedative principle among organics), the medicinal value of this H_2aq as a harmless stimulant would probaby be immense. And it does not seem impossible to obtain water aerated in this way to a certain extent.

At any rate, by the doubling of the chemical formula of glycerine, we obtain

The Sweet Principle of Oil.



$$C_{12}\,H_{16}\,O_{12} = 2\,(C_6\,H_8\,O_6)$$

We shall presently see how this beautiful molecule comes to be constructed during the elimination of oxygen from hydrate of carbon in the production of fats and oils. But yet one remark more on sugars.

In somewhat analogous circumstances, but in this case during the elimination, not of oxygen, but of nitrogen, another kind of saccharine matter shows itself, which, viewed in its chemical formula, indeed it seems strange that it should have anything to do with the sugars. That formula is $C_4\,H_5\,NO_4$, its name glycocoll or glycocine. But though this formula, as also its double, give symmetrical structures, either or both of which may exist in given conditions of existence, yet the culmination molecule must, as in other cases, be a dodecatom, and if we construct this molecule we obtain the following very interesting result :—

Sugar of Gelatine.

Polar matter, urea, . .	$C_2\;H_4\;N_2\;O_2$
Equatorial matter, sugar, .	$C_{12}\,H_{12}\qquad O_{12}$
Polar matter, urea, . .	$C_2\;H_4\;N_2\;O_2$
	$4(C_4\;H_5\;N\;\;O_4$

The diagram is very beautiful, but I grudge to tax the patience of the printer more than is indispensable for illustrating our principal substances.

Glycocoll, then, is an atom of inactive sugar differentiated by one of urea fixed on each pole !

And here we may remark, that this process of differentiating the poles of a dodecatom, provided it be by additions on them of the same elements as constitute the body of the molecule, must soon lead to the construction of dodecatoms with double walls. Thus, when the axis by successive differentiation has become too long for the equatorial part or the body, and when the latter has expanded itself to the utmost, then the latter will also receive on itself such matter as had previously attached itself to the poles merely; hence, after the first isometrical molecule $C_{12} H_{12} O_{12}$, we shall have

Double-walled sugar, etc., . $C_{24} H_{24} O_{24}$;

and, differentiating the poles by the omission of an atom of moisture from each, $C_{24} H_{22} O_{22}$. This double-walled molecule may also result from unification in the ordinary course of natural molecular synthesis.

$$2(C_{12} H_{12} O_{12}) = C_{24} H_{24} O_{24},$$

also the initial member may be $(CHO)_2$. And after that $(CHO)^3$, giving as its molecule

$$C_{36} H_{36} O_{36},$$

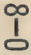
to which we shall soon see peculiar eminence attaches.

But from such molecules all the oxygen soon succeeds in escaping, except a single or double atom on each pole, to differentiate the molecule and protect it from the attacks of the mundane oxygen crowding around. Hence the series of fatty acids and bases.

And here let us bring this paragraph on glycogenic forms and sugars to a close. Though all that our method discovers at sight, as it has now been brought before the student, is as mere nothing, compared with what remains to be discovered by the same method when developed by applied experiment, yet I do not see how it can be denied that our method casts a very pleasing and satisfactory light upon much that has hitherto been altogether dark and strange, and transfers much from the region of the merely empirical to the realm of the rational. No doubt, there are many at the present time who affirm that an experimental result is the last word for philosophy; but that is the same thing as to affirm, that with regard to all that has hitherto been meant by the term philosophy, there is no such thing at all.

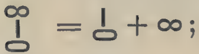
Fats and Oils.

In what has preceded the various possible forms of the saccharine element, CHO have been placed in a certain order, whereof



= CHO

is given as the ultimate form, or that towards which the various transformations tend, and in which they come to a close. It follows from the principles of our molecular morphology (and here merely experimental science will not refuse to go along with us), that in this combination all the affinities are most fully satisfied. Let it not be concealed, however, that here our new science finds in chemistry the application of a principle which has hitherto been recognised only in physiology, namely, the tendency of a structure (when under construction or change) to redintegrate an antecedent or primal form, that is, heredism. The genesis of carbon, according to the data of our molecular morphology, is always accompanied by the genesis of attached hydrogen at the same time. A molecular structure which was previously a unity undergoes segmentation or partitionment into an element of hydro-carbon. Hence, under the law of heredism, when at first in any combination, such as COH, an atom of hydrogen exists separate from one of carbon, these two tend mutually to come together. For the same reason, hydrogen and oxygen, though at first separate in a combination, tend to come together, so as to redintegrate primeval HO or vapour. Thus, we obtain the series that has been given in the diagrams on page 137, of which the issue, where the oxygen regains the aeriform state, is



$$CHO = CH + O$$

that is, the saccharine element is resolved into an element of oil and of oxygen. And hence the prevalent idea in chemistry is, that oily particles are nothing more than saccharine particles from which the oxygen has been mostly eliminated. And in accounting for fats and oils, it is usually not thought necessary to go farther back than to sugars.

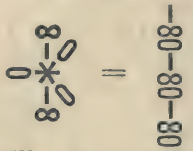
Our molecular morphology leads us to suspect, however, that at least the more highly organized fats and oils—those with which we have to do in treating of the products of hepatic action, and those in the most perfectly organized animals generally—have a genetic history that goes beyond saccharine matter; that, though saccharine matter may be their immediately antecedent state, yet that saccharine matter is not a product of primary synthesis, generated directly by the union of carbon with moisture, giving CHO as the first element, but is a product of a transformation of matter, which has already either formed into the phyto-cellulose element or is tending to do so. And hence there is no permanent ground for surprise that, to all appearance, mere cellulose should be found to be fattening food for cattle and other animals who can digest it, or that oily and fatty matter should exist permanently in the liver. Nor is the existence of oil or fat there to be looked upon as disease, except in so far as it is produced in greater quantities than are eliminated by respiration or otherwise.

Moreover, this view of the chemical history of fats and oils, though doubtless it is a complication, ought not to be unacceptable to the experimental chemist; for it must be confessed that the popular theory, which regards these substances as having their origin in sugars merely as their first commencements, does not carry itself well through, nor go any way at all to explain the modes and regions of their occurrence.

The theory here advanced presents itself as a positive answer to the question, What is the transformation which an element of cellulose, or the equivalent material which is tending to form cellulose, is destined to undergo when the conditions of existence are such as to forbid the construction of cellulose, and these materials fall into the mode of union which is proper to the circumstances? To answer this question, let us now proceed.

Unhappily, an element of nascent cellulose is difficult to represent in diagram. Its axis has for its middle part an atom of aq which is hexagonal, and in each pole of this atom there is inserted an atom of HO. The atom of aq is central, and around it, as an equatorial expansion on each alternate side, there is an atom of carbon attached by its edge, fixing the whole. Now, say that by any means these three atoms of carbon are forbidden to gain this truly vitalized position, or that they are obliged to leave this position, then forthwith the whole must resolve itself into three saccharine elements—

A minim of cellulose



A triplet of saccharines.

Such triplets, however, will not exist single as here represented. Their length of axis, which is so great compared with their equatorial diameter, must hurry them, under the law of symmetry, which is also a law of sphericity, into positions around a common centre, to the end that their long axes may become equal radii, and thus offend no more against the law of sphericity. Now, one pole is hydrogen, and therefore trigonal; the other is carbon, and therefore pentagonal. Hence, if they aggregate around the carbon pole, which must give the most stable molecule, they must form dodecatoms; if around the hydrogen pole, they must give icosatoms. Supposing, then, that either in the course of nature or art, all the oxygen has succeeded in escaping, we obtain from the least element of cellulose the two most notable hydro-carbons, being the molecular states of $(CH)^3$—viz.,

The stearic, $C_{36}\ H_{36} = (C_3\ H_3)^{12}$,
The melissic, $C_{60}\ H_{60} = (C_3\ H_3)^{20}$,

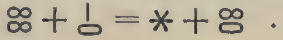
the former being that which is obtained from the fats and oils of the more perfect animals, while the latter is the chemical formula of the most composite of the hydro-carbons—that which is obtained from bees'-wax. It is not to be forgotten, however, that a dodecatom, consisting of $(CH)^5$ as the constituent member, gives $C_{60}\ H_{60}$, as well as an icosatom of which $(CH)^3$ is the constituent member. And we shall afterwards find that there is good ground for expecting $(CH)^5$ in nature as well as $(CH)^3$.

There is another reason also for the eminence of $C_{36}H_{36}$ in nature. Thus, the least particle of water, when given in terms of HO, is $H_{36}O_{36}$; add C, and let O go off, and there is given the stearic, etc., hydro-carbon. Nor is it to be forgotten that structures which, as members of molecules, can give icosatoms, can also, under a more loose development, give also tetratoms, which, in their turn, may compose themselves into icosatoms, giving a very tenderly constituted molecule, into which there enter no fewer than 240 atoms of hydro-carbon, distributed in sets of 12, too ready to degenerate into simple dodecatoms; so that, looking to such a structure as that of the brain, we may possibly find as the

Neuro-cerebral hydro-carbon,. . . $C_{240} H_{240} = 20(C_{12} H_{12})$ . . . Softened.

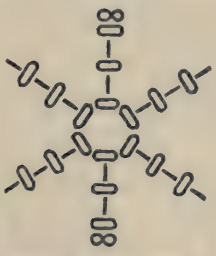
Now Liebrich found as the formula of his brain-stuff, $C_{232} H_{240}$. But all this is so purely conjectural, that we need not dwell upon it.

Not so problematical, however, is the structure of the molecule of the most perfect kinds of fat and oil. Not so easily broken down and softened must be the dodecatom in which the atoms of carbon are centrad, and of which the formula is $C_{36} H_{36}$. Suppose, indeed, that it exists free; then in this terraqueous globe, in which oxygen gas penetrates everywhere, an element of oxygen gas will no doubt soon attach itself on the extremities of one of its axes; and in this way it will be differentiated and its stability increased. The course of nature will be this: An element of oxygen gas—that is, two atoms—will attack the atoms of CH, which terminate one of the axes of the dodecatom $C_{36} H_{36}$. The terminal atoms of H, along with the single atom of O incident upon them, will then lapse into aqueous matter, which will go off when heat is applied, and there will remain on each pole an atom of carbonic oxide—



and we have the natural

Stearic or Oleic substance.



C_{36} H_{34} O_2.

But where such molecules are generated by the reduction of saccharine elements, we can only expect that on each pole of such a molecule there will be a saccharine, giving

$$CHO + C_{36} H_{34} O_2 + CHO = C_{38} H_{36} O_4.$$

Now we have already seen that atoms of CHO in hydro-carbon or fatty regions tend to form into atoms of glycerine, of which the ultimate or true syrupy form is $C_{12} H_{16} O_{12}$. The single dodecatoms of $C_{36} H_{34} O_2$, in like manner, will tend to form into composite dodecatoms of $(C_{36}H_{34}O_2)^{12}$. Thus ultimately there will result a beautiful and finely differentiated structure, its body consisting of oil, its poles, of a sweet principle. We thus obtain

Stearine.

$$C_{12}H_{16}O_{12}\ (C_{36}H_{34}O_2)^{12}\ C_{12}H_{16}O_{12} = C_{456}H_{440}O_{48} \div C_{38}H_{36.6}O_4.$$

Now, this when drawn and quartered according to the usual practice of chemists, so as to reduce the glycerine to a single atom, its formula supposed to be $C_6H_8O_6$—that is, dividing it by 4—gives $C_6H_8O_6 + 3\ (C_{36}H_{34}O_2)$, the tri-stearine of chemistry! Not but that a tri-stearine may be one of the states of the true stearine when nascent, or when undergoing destruction in the laboratory—for it is a symmetrical structure of much power. But, according to morphology, we must look upon the composite dodecatom with differentiated poles as one of those culmination forms towards which nature is ever tending, and which she generally succeeds in constructing.

The chemical custom of cutting down every formula till one of its constituents is reduced to unity, is utterly out of keeping with the entire procedure of nature. Why should all molecules be made to stand upon one leg, when the visible creatures formed of them have never less than two at least?

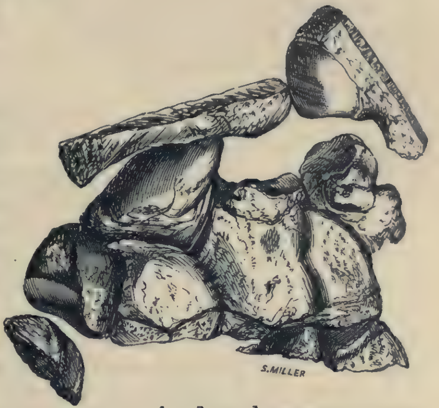
ARTICLE VIII.—*On some Cases illustrating the Results of Excision of the Wrist for Caries, the Treatment of Deformity from Contracted Cicatrix, and Antiseptic Dressing under circumstances of difficulty, including Amputation at the Hip-Joint.* By JOSEPH LISTER, F.R.S., Professor of Clinical Surgery in the University of Edinburgh.

AT a meeting of the Medico-Chirurgical Society of Edinburgh on the 6th June, a communication was made by Mr Lister to the following effect:—

Mr President,—I have to exhibit this evening, in the first place, a case illustrating *the results of excision of the wrist for caries*, performed according to the principle and method described by myself in the *Lancet* several years ago; the principle being the removal of the entire articular apparatus of the wrist, including all the carpal bones, together with the articular extremities of the radius and ulna and five metacarpals, so as to place this excision in the same favourable position as that of the elbow, while the method (fully described in the *Lancet*) permits free access to the affected bones with the least possible injury to the tendons. The young man now before you is Case 5 of those described in the *Lancet* (25th March 1865), and I may quote shortly from the account there given. "Thomas Morris, aged twenty-one, a miner, was admitted on the 8th of July 1864.

About six months before, when suffering from smallpox, he was seized with inflammation in the right tibia and the left carpus, resulting in necrosis of the former, and caries of the latter. When he came into the hospital, the back of the wrist was swollen, and presented two sinuses, through which a probe could be passed down to the diseased bone. The hand was extremely feeble, and drooped when the arm was extended horizontally. It was very painful, interfering seriously with his night's rest, and his general health was otherwise much deranged, his pulse being 135, and his appetite impaired, while he was constantly bathed in perspiration." On the 16th of July, I removed the parts represented in a sketch given in the *Lancet*, as you will see from the copy I have brought with me. (The sketch is reproduced below.)

You observe, it includes the entire articular apparatus of the wrist. "A carious cavity occupied the place of the semilunar bone, and the adjacent part of the cuneiform was excavated. The other carpal bones, except the trapezium, were anchylosed into one mass." Nearly seven years having elapsed since the operation, we are in a good position for judging of its results. You observe that the hand has, on the whole, a very natural appearance, but that it presents at the dorsal aspect a transverse prominence, caused by the growth of new bone from the divided end of the radius, which seems to have become expanded into a socket for the reception of the ends of the metacarpal bones which have been rounded off by ossific deposit. Thus, a new joint has been constructed, of a form which, I may remark, I have seen in another case after the same operation. The formation of new bone has not taken place to the same extent from the ulna, and the hand has in an exaggerated degree the droop to the ulnar side which it assumes in the normal condition of the limb in a state of repose. Nevertheless, eversion and inversion of the hand can be carried through as great an angle as usual, proving that the tendons of the flexors and extensors of the wrist, necessarily divided in the operation, have formed secure new attachments. Flexion and extension of the wrist, and pronation and supination, are, you see, freely performed, and every joint of every digit has its normal movement, those of the knuckles only being not quite so free as in the other hand. You remark the perfect freedom of the actions of the second joint of the thumb, the extensor secundi internodii policis having been left intact by placing the radial incision in the angle between



it and the indicator, where the cicatrix is still seen. The hand has a powerful grasp, as any of you may be satisfied by shaking hands with him. [The patient, before thus exhibiting his powers to the members of the Society, made a statement to the effect that he was engaged in charge of a steam-engine, and found his left hand equal to the right for all sorts of work, including wheeling a heavy barrow, and various other actions of a laborious and complicated character.] This case, Mr President, is certainly very gratifying, as an example of what may be done in the way of saving a hand from amputation by means of excision; but it is still more gratifying to be able to avoid excision by early free incision, practised antiseptically, before sinuses have formed, and followed up by antiseptic dressing. Five cases of this kind in the adult have occurred in my practice in the course of the last year, and useful as is the hand which you have just seen, it is of course not equal to the perfectly natural condition that may be retained by antiseptic management.

The next case I have to show illustrates what I believe will be found a valuable method of treatment for certain cases of—

Deformity from contracted cicatrix.—This young woman fell into the fire when an infant, burning the left side of the body to a frightful extent, the scar being seen to reach from the upper part of the neck to the lower part of the forearm, and laterally from near the spine to the mamma, the mammilla having been destroyed. The healing of the huge granulating sore, and the subsequent shrinking of the cicatricial tissue, led to the formation of a web of several inches in length, constituting an extension of the posterior fold of the axilla downwards, and binding the arm pretty closely to the side. We all know how unsatisfactory the treatment of such cases commonly is. The web, if divided with the knife, becomes reproduced by the coalescence and contraction of the granulations, and the condition of the patient is too often little, if at all, better than it was originally. In the present instance the tendency to coalescence of the granulations has been counteracted by a method which I employed first several years ago in a case of webbed fingers, viz., bringing the elastic traction of india-rubber to bear upon the angle of the wound made by cutting through the web. At the same time this plan of treatment has been greatly assisted, both in the earlier and later stages of the case, by antiseptic management. The irritation of the cut surface by putrefaction being avoided during the first few days after the operation, inflammation was entirely prevented, and thus we were able, even from the first, to use a degree of freedom with the limb, in raising it from the side, which would have been otherwise intolerable. It happens that I have now under my care in the Infirmary another similar case, operated on only two days ago, when a web of great length, and involving the whole breadth of the axilla, was freely divided; and my friend Dr Holmer of Copenhagen, who is here to-night, and who saw the patient dressed this morning, can bear me out when I say that the skin around the very extensive raw surface was perfectly free from redness or tenderness; while the young man was able to get up and move about almost as if nothing had been done to him. The advantages of antiseptic treatment have been equally great in the further progress of the case before you, for when sores are efficiently protected both from the irritation of putrefaction and from that of the antiseptic, they heal under circumstances inconsistent with cicatrization under water-dressing; and the mechanical irritation involved in the varied traction to which the sore has been here exposed, would probably have prevented healing altogether had the ordinary application been made. I have thought it best to exhibit the patient before healing is complete, in order that you may see the treatment in progress; and as the mode of dressing presents several features of interest, I will venture to trespass upon your time by performing it before you. The retaining bandage being now removed you see the rod of india-rubber [a rod of vulcanized india-rubber about as thick as the little finger] which exerts its traction upon the angle of the wound in the axilla. Its ends are attached to pieces of bandage which are tied in a half-knot over the top of the shoulder and then secured to the ends of a padded handkerchief passing under the other armpit, the shoulder being protected from the pressure of the knots by a shield of thick gutta-percha moulded to it. It is three days since the dressing was last changed; yet it remains perfectly free from putrefactive smell, implying that the antiseptic gauze, which is the essential material of the dressing,[1] has answered its purpose well; and the axilla is a situation that illustrates the perfect manner in which it adapts itself to any irregularities of surface. Between the gauze and the healing sore is interposed the oiled-silk "protective," to exclude the irritating influence of the antiseptic; and, in this particular case, the value of the protective is especially marked. For, if it were omitted, not only would the progress of cicatrization be arrested, but, as we have found by experience, the newly-formed cicatrix being weak from the traction to which it is subjected by the old scar around, becomes excoriated under the influence of the carbolic acid furnished by the gauze. Under the protective, on the other hand, healing proceeds securely and uninterruptedly.

In the earlier stages of the case the protective rendered further service, because, being applied next to the raw surface, it prevented the possibility of the granulations coalescing below the caoutchouc band, and enclosing it in a tube of granulation structure.

You observe how efficacious the india-rubber band has proved. According to the tightness with which it is tied up, the pressure which it exerts upon the angle of the wound can be precisely regulated, so as to cause continuous ulceration, if desirable; and thus, so far from the angle of the wound becoming filled up by granulations, the original incision has been, as it were, extended by the ulcerating process considerably beyond its original limits, yet without any pain to the patient; and you can observe the fibres of the pectoralis major and latissimus dorsi lying bare in the groove which the caoutchouc rod occupied. Meanwhile cicatrization has advanced both on the chest and on the arm almost up to the margins of the groove. The india-rubber rod, as soon as it is removed, is well washed with watery solution of carbolic acid; and, as caoutchouc imbibes the acid, it becomes itself antiseptic for the time being. The sore having been also washed with the lotion [a solution of one part of the acid in two hundred parts of water is sufficiently strong for the purpose], I now apply a piece of protective dipped in the same liquid, and outside this the rod of india-rubber, and then a piece of well overlapping antiseptic gauze, bandaged securely both to the arm and to the chest.

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[1] This gauze contains carbolic acid stored in insoluble resin among the fibres, with the addition of paraffin to avoid undue adhesivenss, in the proportions of one part of carbolic acid, five parts of resin, and seven parts of paraffin. It is manufactured by Macfarlan & Co., North Bridge, Edinburgh.

The gutta-percha shield for the top of the shoulder is padded with the gauze; and this illustrates another valuable use of that material. Supposing that the padding were of an ordinary kind, such as cotton-wool, putrefaction could hardly fail to take place in the sore. For the edge of the protective comes up to the immediate vicinity of the shield, and the discharge escaping from beneath it would soak into the padding and putrefy there, and the fermentation would be communicated to the fluid beneath the protective; since this layer, while it protects the sore from the irritation of the antiseptic, necessarily involves liability of any organic material that lies beneath it to putrefaction on access of the ferment. But by having the padding of the shield itself antiseptic this difficulty is overcome, the gauze of the axilla and that of the shield coming in contact with each other; and we have not had putrefaction occur on any single occasion since the operation. The advantages of this material are still further exemplified in this case by its use in the form of bandage, every turn of which, instead of affording a nidus for putrefaction, increases the antiseptic efficacy of the whole dressing.

It yet remains to show you what the patient can do in the way of raising the arm. At the time of the operation I did not get it quite up to the horizontal level. In the course of a few days it could be brought up to that level. Then her ambition came to be to reach up with her finger-tips to the handle of a small cupboard in the ward, fixed at some distance above the floor. Afterwards, stretching a little higher day by day, she was at length able to reach to the top of the cupboard, about nine inches higher; and now, within the last few days, by means of this species of gymnastic exercise, she has succeeded in getting her knuckles even higher than the top; and you see at present that she can raise both hands well above the head, and touch nearly as high a point on the wall with the one as with the other. Thus, instead of the usual course after such operations—namely, the web gradually forming again, and what was gained at the operation being ultimately lost—we have here made constant progress in advance of what the operation effected, and all this without the use of any means of extension, or any restraint upon the natural actions and usefulness of the limb. There can therefore, I conceive, be no doubt that, by persevering a little longer with the same system, we shall attain all that can be desired.

The next case I have to bring before you is an instance of recovery after *primary amputation at the hip-joint*, a thing by no means of common occurrence. The injury that necessitated the operation in the boy now before you (five years of age) was of extreme gravity. The little fellow had been endeavouring to climb up into a luggage-truck, when his right leg became entangled in one of the wheels, and frightfully mangled. The hamstrings and popliteal vessels were torn through, the knee-joint opened posteriorly, the femur fractured in the wound, and the soft parts of the thigh contused to so high a level, that I was obliged, as you observe, to make the anterior flap shorter than usual, and eke it out by extending the posterior flap; and, in spite of this, a small portion of the anterior flap lost its vitality from being implicated in the contusion. Now, there can be no doubt that, under such circumstances, the avoidance of putrefaction in the large wound was a most important condition of his recovery. Considering the state he was in, I believe that, if we had not succeeded in this respect, he would not have been alive before us this evening; and my reason for bringing him here is, that he affords another striking illustration of the advantages of our present mode of antiseptic dressing.

Of all incised wounds, those resulting from amputation have been the most difficult to manage antiseptically; and of all stumps, that at the hip-joint is the worst to deal with. When a stump has considerable length, we have for some time past managed quite satisfactorily by having it enveloped in about eight layers of the gauze, a piece of impermeable tissue, such as thin Mackintosh cloth,[1] being placed beneath the outer layer to compel the discharge to travel throughout the extent of the antiseptic tube formed by the dressing, before reaching the external air. The essential condition of free overlapping of the surrounding skin is thus complied with, while the use of a spray of carbolic acid lotion avoids any chance of the entrance of septic mischief during the changing of the dressing. But in a case like this, such an arrangement is of course impossible; and we had two special difficulties to contend with. One was the vicinity of the inner angle of the wound to sources of putrefaction in the perineum. This was overcome partly by stitching up the wound very closely at the inner side, and having the "drain" (of lint soaked with carbolized oil) projecting towards the outer aspect, so that discharge might be as small as possible towards the perineum. At the same time, the gauze, from its absorbent as well as antiseptic property, was of the utmost value, and, being folded of double thickness at the perineal side, answered the purpose completely; while in this case, as in the last you saw, the antiseptic quality of the bandage was of peculiar value, every turn round the perineum adding to the antiseptic security. And I may notice here another incidental advantage of this bandage, namely, that the slight adhesiveness which it possesses makes it cling to the part to which it is applied, and prevents the turns from slipping, as those of a calico bandage are so apt to do. I should add that, during the changing of the dressings, two of Richardson's spray-producers, worked simultaneously by two dressers so that each commanded half of the large wound, proved adequate to the purpose.

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[1] This tissue is known by the caoutchouc manufacturers under the name of "hat-lining."

The other great difficulty was the vicinity of the wound to the bed. Had the discharges been permitted to soak into the bedding, they would have soon putrefied there after losing the volatile antiseptic; and the products of putrefaction, soaking back into the dressing, would in all probability have neutralized its antiseptic virtue, and the fermentation would have penetrated to the wound. This danger was averted in the simple way you see here illustrated, —by having the gluteal region repose on a layer of folded gauze lying on a piece of Mackintosh cloth. In this manner the bed in which he lay was rendered itself antiseptic at the part with which the wound was concerned, and putrefaction was avoided from first to last.

While speaking of the advantages of the gauze, there is one other to which I cannot forbear alluding. If you apply this mass of it, consisting of thirty-two layers, closely to the face, you find you can breathe freely through it, as through a respirator. Hence, Sir, one great advantage of this dressing will be, that it will deprive those who discuss the antiseptic treatment of all excuse for speaking of it as operating by "excluding the air." We do not exclude the gases of the atmosphere at all, but adopt efficient means to destroy the energy of its floating ferments.

Part Second.

REVIEWS.

Selected Obstetrical and Gynæcological Works of Sir James Y. Simpson, Bart. Edited by J. WATT BLACK, M.D., etc. Edinburgh: Adam and Charles Black: 1871.

THE late Professor of Midwifery in the University of Edinburgh was so widely celebrated, so well known, and exerted so potent an influence on the medical science and practice of his day, that it was an evident necessity that his works should be republished. Simpson was during his lifetime constantly in the press, hurrying with unwearied energy one pamphlet or journalistic article after another into the world, so that the *disjecta membra* have to be collected. This work he himself partially effected, in the two handsome volumes edited by Drs Priestley and Storer, and published in 1856 by the excellent firm of Messrs Adam and Charles Black. These volumes are now out of print, and they did not contain all that his literary executors now consider it expedient to republish. These literary executors (and especially their chosen agent, in regard to the volume now before us, Dr Watt Black) have had a task of no slight onerousness and responsibility to perform, for they undertake to present to future medical men an eminent physician, whom they esteemed in the highest, we might almost say, the most exaggerated manner; and, besides doing the late Professor justice, they have the laudable desire to justify to all time coming their own opinions of his exceeding greatness. They have placed an ingenuous young obstetrician in the front, not only as leading off with this first-published portly volume, but as having the most important part of the task to perform. No doubt Simpson's discovery of chloroform will always form an excellent "handle" to his name; it forms his claim to popular renown; but apart from this, Simpson's reputation demands something broader for its justification. It is as Professor of Midwifery in the University of Edinburgh that he must make good his position in science and as a practitioner of the healing art. In a recent address, Professor Christison has truly said that the first duty of a Professor is to teach, the second to advance the science and art of which he is the expounder. This volume, edited by Dr Watt Black, is what the world has to accept as Simpson's work in advancing the science and art which he professed. His special writings on Hospitalism and on Anæsthesia, and his *Medical Times and Gazette* lectures, are intended to form two other volumes, and are to be edited by his son and his nephew respectively. After all these are published, this first one will still retain, and justly, its place of pre-eminence. It contains the best of his hurried work; we say *hurried*, for almost everywhere in the volume we see traces of haste and of imperfection. These slight faults every one will expect, and probably also excuse, who knows the nature of Simpson's activity, his eagerness, his impatience, his restlessness, his versatility. Let us now look at the work itself. Before doing so we must make one evidently true general remark regarding it—namely, that, putting out of view such qualities as its fragmentariness, it has no such great features as will account for the author's great fame. That depended on the general history and character of the man, subjects on which we do not wish to enter, and greatly on one special point in his character, that he was possessed of originality and boldness, and therefore was naturally a leader.

One of the chief modern methods of advancing science is the use of statistics. Much has already been done by this engine, but as yet we only see the beginning of its powers and advantages. It has been applied to many masses of data which have been laboriously collected, or more easily brought together for the purpose, and the results already got are invaluable. But every day new and still newer observations are being made and recorded, from whose rude accumulation the statistical method will eliminate beautiful *arcana naturæ.* It was naturally to be expected that the ardent genius of our author should make him lay hold of this instrument. Unfortunately, his genius was often too ardent, and led him to treat statistics in an unscientific way, not calmly awaiting the dry and cold result of his analaysis, but vainly attempting to extort what he desired to find.

That Simpson had considerable knowledge how to use statistics, we need no further evidence than a perusal of his "Memoir on the Sex of the Child, as a cause of difficulty and danger in human parturition," which appears at page 307 of the volume now under review. It appeared in this Journal in 1844, and was nearly, if not quite, the earliest, and remains nearly, if not quite, the best piece of scientific work the author ever did. It is purely a statistical investigation, and the statistics were borrowed from the well-known collection of data by the great Dr Collins of Dublin. To this gentleman the work was dedicated when it was separately published, and it is melancholy to reflect how soon this traffic in civilities was changed into a long and bitter quarrel, full of petty personalities,—a quarrel over statistics! of all things, over statistics which neither of the parties, biassed as each was by the feud and otherwise, could get the courage to read aright ere he died.

Clarke and Quetelet, both statisticians, had pointed out the main and basic facts of this memoir, namely, that the heads of males are bigger than the heads of females, and that deliveries of male children are more difficult and dangerous than deliveries of female children. Further, Riecke had shown that males more frequently required extractive assistance than females. Here Simpson took up the subject, and with admirable precision and perspicacity stated it, elucidated it, and followed it out in a great variety of its bearings; showing, by his arrangement and conduct of the matter, that he had a natural turn for statistics, and knew its more simple methods of proceeding. The result is, that nothing now is more generally known than the matter of this memoir.

Although we wish to make no deduction from what we have said, yet we must add, that the causes of the special male infantile mortality are not yet known. Before this memoir was written, it was believed that males had a special liability to mortal ailments, and in this poor way was their mortality accounted for. Simpson rejected this view, and tried to show that the whole special mortality of males could be traced to the extraordinary size of the male head. His proceeding was quite logical. He believed he could statistically show that the special mortality was connected with the mechanism of passing this big head through the female passages. But his statistics were not equal to the strain he put upon them, and he was misled. He showed, however, the great importance of the special squeeze of the male head during its birth. In spite of his apparently sufficient demonstration of the exclusive influence of this compression, it remains a general belief among biologists that the male is, from his conception onwards till many years after his birth, specially liable to die, more liable to die than the female, more liable even than she would be did she get as severe a squeeze in birth as the male gets. Perhaps this circumstance might afford revengeful satisfaction to those who believe in the subjection of women, were it not that Simpson's lucid arguments clearly show that the poor mothers suffer quite as severely from the squeeze as their male offspring, and that there is no evading the demonstration of the injurious influence on them of the births of males.

As we have already hinted, Simpson was not always worthy of imitation in his mode of using statistics. It was especially in his later years that he was careless. Perhaps the recollection of his youthful triumphs with this analysis led him to resort to its aid in practical questions on which he had already unfortunately made up his mind. Few men have logical faculties so acute and minds so free of prejudice as to render them safe handlers of this analysis. If we look at the work even of our professed statisticians, some of them paid by Government to do the work, we find specimens of repeated and gross failure. We could easily give justification of this statement in the treatment of the influence of marriage, but we only refer to it in passing to another admirable specimen of Simpson's manipulation of figures—his paper on the alleged Infecundity of Females born Co-twins with Males. In the case of this memoir, he not only manipulated the numbers, he also laboriously collected them. This paper was also published in an ancestral number of this Journal, and it appeared before that on the Sex of the Child, to which we have already referred. It settles the question, which had been long an open one, showing that females co-twins with males are as fertile as women generally. In the end of it he has an excellent chapter on a subject to which he in later life paid much practical attention, the sterility of married women—a subject whose study has been truly sterile in a practical point of view, if we do not condescend to regard the collection of guineas as in itself a worthy object. There is a pregnant little sentence dropped by Dr Black at the end of a description of Simpson's treatment of sterility. It is Black's, not Simpson's. We wish it had been written by our author, whose pen was never dry. Though it is short it speaks both loud and long. Yet it speaks with a painful vagueness, and a vain pretence that exactness was possible and latterly practised.

"In consequence," says Dr Black, "of the gratifying results sometimes produced by incision of the cervix uteri in obstructive dysmenorrhœa and sterility, that operation became an extremely favourite one with Simpson. Certain risks connected with it, however—and in particular its liability to be followed by pelvic inflammation—inclined him ultimately to a rigorous selection of cases, and to the enjoining of recumbency for several days after the performance of the operation."—(P. 680.)

Nothing is more characteristic of modern progress than that it is mechanical. In every department of civilisation, in every department of science, progress is being made by applications of mechanism. In no department of human activity is this more clearly seen than in physiology and in the practice of medicine. Take for examples the stethoscope, the ophthalmoscope, the laryngoscope, the sphygmograph, the speculum. To this kind of progress Simpson contributed, and again it was done in the earlier part of his life. The probe had by many physicians been used in the diagnosis and treatment of uterine disease. But Simpson saw that this little simple instrument might be made a deal more of. With his usual zeal and energy he set himself to be the promulgator of the advantages to be derived from the use of the uterine sound, and so exhaustively and thoroughly did he do the work that that instrument is intimately associated with his name in the minds of gynæcologists. A clever French author has recently written a book on measuring and catheterizing the uterus, as he absurdly calls it, and has evidently the intention of diminishing the amount of credit generally awarded to our author in connexion with this subject. But it is a vain attempt. Simpson's papers, published in old numbers of this Journal, about the year 1844, will always be esteemed as clever and good articles, which give him a clear title, not to any discovery, but to great, indeed paramount credit, in connexion with the popularizing this instrument for the profession. Like a deal of his other works, his papers on the uterine sound were never finished. But they had another peculiarity. Some authors write even systems in this unwise way; we have, for example, a treatise on the diseases of women, where the diagnosis is made the main thread to which all the rest of the matter is tacked. It was on this plan that our author proceeded with the uterine sound. In describing its uses he got a centre around which he made to crystallize a great deal of gynæcological science and literature. These papers are well worthy of perusal, even although now they are a little antiquated. They evince a higher scientific tone than most of his later work.

There is no doubt that, through a lucky hit, an author often gains some reputation that he does not entirely deserve. Simpson had so much fame that it is not astonishing to find some of it not altogether merited, but the result of a lucky hit. In 1846 Dr Simpson wrote a short paper on the membrane sometimes expelled in dysmenorrhœa, and pointed out its true nature. But Simpson was not a great pathologist, and this paper contains several statements and arguments that were very wide of the truth. Nevertheless, it contained this important announcement as to the decidual structure of the membrane. Oldham had, before Simpson, made the same statement, and perhaps others in Germany before either. But really no one had much credit in the matter. Long ago, Hunter and Baillie had pointed out that the membrane of dysmenorrhœa was of the same nature as the decidua; and the decidua was of the nature of false membrane, therefore the membrane of dysmenorrhœa was false membrane. Nothing simpler. All repeated,—of course the membrane of dysmenorrhœa is false membrane. Then came the researches of Sharpey, Weber, Goodsir, and Coste, and the decidua was no longer of the nature of false membrane; it was hypertrophied mucous membrane. Well, of course, as the dysmenorrhœal membrane was of the same nature as the decidua (as Hunter and Baillie had shown), it was now not false membrane, but mucous membrane. Nothing simpler. It did not require half an eye to observe the true nature of decidual membrane. All saw it at once. Who made the lucky hit of doing it first? He has the right *sumere superbiam*, etc.

Simpson was very ambitious, intensely greedy of fame, of being talked about; and he was willing to work for his objects, to sweat, to live laborious days. He could not be content with the quiet dignity gained in the laboratory of the true scientific man. He resolved to make great innovations in practice that would create a noise. In addition, he systematically threw himself into every popular professional wave, and he always rose to the crest of it. Sometimes, as in the case of chloroform, he was eminently successful. Many a time he was not successful, but he was never discouraged, never wearied. The most elaborate paper in the volume now before us, is that on the Treatment of Placenta Prævia. It was his first great venture of the kind we have referred to, and it brought him notoriety enough. The excitement produced in the obstetrical world by his proposal can scarcely now be imagined. We have not had for a long time an obstetrical "row," and it is to be hoped we shall not have one again. They are affairs generally disgraceful to all concerned, sometimes dishonourable. The gladiators in the placenta prævia controversy were Simpson and his senior, but still surviving, Robert Lee. *Arcades ambo.* They carried fire and sword each into the other's territory, *alternando.* Sometimes Simpson had the best. He was always up to time. He had occasionally the advantage in his letters of a highly-prized pervading flavour or whiff of aristocracy, dating, of course quite accidentally, an epistle to Lee from Stafford House. If he could not hit him hard in the text, he had Ayscough's Shakespeare, or a volume of classified "Elegant Extracts," from which he could get a stinging motto to prefix to his article. Upon the whole, Lee got, in a literary point of view, the worst of it; but only in that point of view. It would be an "act of insanity," says Lee, "to tear away the placenta." Then rejoins Simpson (p. 295), quoting from the vaccine controversy, "'It would, undoubtedly,' as anxiously argued Dr Brown, some twenty or thirty years ago, 'be *downright* [italics are Simpson's!] madness to imagine they will condescend to encourage vaccination.'" So the foolish men wrangled and fought, Lee bawling "insanity," Simpson placing himself on Jenner's pedestal. Alas! after it is all now long past, we fear Lee has the best of it. He may take up the speech of Hamlet (Act v. Scene 1) and smile.

The placenta prævia affair was a splendid example of Simpson's ingenuity and power. He found everything ready-made to his hand, no doubt; but where would Hamilton's theory and Kinder Wood's or Radford's practice have been without the genius of Simpson? Nowhere, or where it is now, or where it should be. It was, we believe, Hamilton's opinion that blood, in cases of placenta prævia, ran from the detached placental surface. This opinion is the foundation of the practice of removing the placenta, which Kinder Wood, Radford, and Simpson recommended. There is not a particle of good ground for the opinion or belief, and, so far as we know, it is entertained by nobody. But Simpson adhered to it, and he thus got an explanation of his further opinion, that in cases of unavoidable hæmorrhage the bleeding ceased when the whole placenta was separated, the sources of supply being cut off. This farther opinion is also without sufficient grounds. Simpson attempted to get a basis for it in experience, and with marvellous zeal he hunted out every case of complete separation of the placenta recorded, not in his case-book, but in the annals of midwifery. His zeal outran his wisdom, for he forgot that spontaneous separation, as in the cases which he found on record, was a quite different affair from artificial separation—the practice which he recommended, with the vain expectation that it would have the same consequences as spontaneous separation. The proper course for Simpson to have pursued was to try his practice, get his friends to try it, and to abide by the result. He could not wait for this slow and sure and only true and satisfactory proceeding. He would first propose and force the treatment, and condemn Lee and all objectors, and trust to the good fairy being on his side, and to his practice turning out the proper one. It is a curious story. If the weekly journals were to be believed, the new treatment was successful; nothing but success and triumph to Simpson. But underneath there was truth beginning to appear—not in the weekly press. Reports of hospital practice, text-books, discussions in societies, were published, and all more or less repudiated the grand new successful practice. It would not, in vulgar phrase, go down. This turn of matters Simpson was quick to see; and he now fell to saying, he did not mean to supplant old practices;—the venerable turning and delivering, he considered still the great treatment. His new treatment, by separating and extracting the placenta, was only for such and such special cases; it was not a generally applicable treatment. But still the decadence of the novelty was evident, and now the grand and invariably successful and frequently applicable treatment is all but forgotten. It has, at last, a fair chance of being calmly considered and rightly judged, along with its puny progeny, the treatments of Cahen and Barnes. If anything was required to show that Simpson himself had at last lost faith in his own once glorious cause, it is furnished by Dr Black, in the form of a little sentence at page 295. This sentence Simpson would not have placed where it is. It is a bad sentence in every way. We believe Simpson never could have intended to have it published, for it casts an air of ridicule over all on the subject of placenta prævia that precedes it. To the admirers of Simpson it has a doubly melancholy aspect, for it was spoken in 1870. It is as follows:—" Sometimes the hæmorrhage might be stopped by simply separating a little more of the placenta than what had already been detached; for, as the bleeding came from the line of vessels between the placenta and the uterus which are on the stretch, the separation relieved the tension, and by this practice there is a greater chance of saving the child." Here is an entirely new set of opinions, quite inconsistent with the old Simpsonic opinions. Alas! Dr Black is not so astute as his master.

In the preceding pages we have criticised some of Simpson's labours, and here we stop. It would have been easy to proceed, but we have exhausted our time and journalistic space, and we are of opinion that our remarks will give a fair impression of the remarkable and never commonplace works of the late Baronet. Dr Watt Black has done his work honestly and well, and produced a fit monument of his master.

We conclude by saying that the syllabus of lectures, with which the work opens, should never have been published. It is in every respect unworthy of the place it occupies. To notice its varied faults would be unjust to Simpson, who, we are sure, never intended it for publication, and would never have given his consent to its appearing in print.

Smallpox and its Prevention, including Experiments upon the Lower Animals, etc. By EDWARDS CRISP, M.D., M.R.C.S., L.A.C., etc. London: 1871.

A New Method of Treating Wounds (Gruby's System), and the Medical and Surgical Aspects of the Siege of Paris. Outlines for a Non-Official Report to the Physician to the Right Hon. the Minister of State for India. (Including Investigations concerning Pyæmia, the Danger of the Introduction of Calf Vaccination into our Indian Possessions, the Tent Hospital System, etc.) By CAMERON J. F. STUART MACDOWALL, Surgeon Indian Army, 3d Bombay Light Cavalry. (Present during the whole of the siege.) London: 1871.

Letters on Vaccination. By WM. WOODWARD, M.D., Worcester. (Reprinted from the *Worcester Herald.*) Worcester: 1870.

On Some Advantages of Animal Vaccination for the Prevention of Smallpox. By A. VINTRAS, M.D., Physician to the French Hospital. London: 1871.

Letters to the "Times" on Smallpox Encampments, and a Word on the Contagious Diseases Acts. By Surgeon-Major T. ATCHISON. London: 1871.

History of the Smallpox Epidemic in South Shields, 1871. By ANDREW LEGAT, M.D. Edin., L.R.C.S.E., South Shields. South Shields: 1871.

THE opposition to the Vaccination Act has been, in many parts of England, really serious; and many people have been agitated and somewhat alarmed by the vehement assertions of the Anti-Vaccination League, whose existence is perhaps scarcely needed to prove that it is easier to prevent smallpox than to cure human folly. During the last two years an unusual number of books and pamphlets on vaccination have been published. They may be divided into three classes: expositions of the evidence accumulated of the great benefits derived from vaccination, written to reassure the public mind; suggestions as to how the assumed evils of vaccination may be guarded against; and, lastly, scientific inquiries into the nature of vaccinia, and the proper way of making the most of the immunity which it confers.

Dr Woodward of Worcester has issued a small tract of thirty pages which gives a very good résumé of evidence in favour of the great discovery of Jenner. It is to be had at the price of 4s. per dozen; and we should be well pleased to see all the opponents of vaccination who are able to read were served with a copy. As Dr Woodward has prefixed extracts from five favourable reviews to the beginning of the tract, it is to be supposed that they would commence its perusal in a favourable spirit.

The advocates of animal vaccination have had the luck to hit upon a subject by which they can introduce their names to the public without any serious amount of work and thought. In order to form a background for their argument, they generally commence by admitting that human vaccine matter has lost somewhat of its protecting power, and that syphilis is occasionally communicated by vaccination. They argue that lymph taken from the heifer has a superior protective power; that it is as easily inoculable as human lymph; that no constitutional disease can pass with it into the human system; and that, in case of a great epidemic of smallpox, a large supply of heifers' lymph could be more readily obtained, one calf being capable in five days of producing enough of matter to vaccinate at least five hundred people. As long as the matter was left in the hands of the preachers of animal vaccination, their proposal looked plausible; but from the inquiries made by Dr Seaton in Paris, Holland, and elsewhere, published in Mr Simon's Twelfth Medical Report to the Privy Council, it was shown that lymph taken directly from the heifer loses its activity so quickly, and is, as compared with human lymph, so difficult to inoculate, that Dr Vintras has little reason to complain if we pay no attention to his arguments until he has replied to those of Dr Seaton, which he does not even allude to.

We shall, however, reproduce the evidence which Mr Macdowall has given us bearing upon the correctness of Dr Vintras's statement, that "heifer's lymph nearly always gives a positive result, and revaccination a means of success greater than that derived from human vaccine."

"Dr Quinquand had one-third successful cases with the virus from the calf, but *all* his cases were successful with virus from a child's arm" (Jennerian vaccine, as the French complimentarily call it). "Dr Thevenot, with calf vaccine, had only two successes in twenty-one cases."

Thirty-two surgeons in Paris during the siege sent in reports on vaccination from the calf. *One* says that vaccine from the calf became much better after transmission through the arms of three or four children, though bad and difficult to introduce the first time; "the rest (thirty-one) found vaccination from the calf most provokingly unsuccessful, succeeding at the very utmost only in a fourth of the children vaccinated directly, and *much* less from calf virus tubes or glasses. The vaccine pustules were always small, and contained little real matter, and much epithelium. The fifth day is recommended for collecting the calf virus. Calf virus, which has *spontaneously* appeared on the animal, has been found to be better than that which is inoculated—given to the calf from a child's arm. It is a rare disease, however, amongst the herds, and it is difficult to find a single case."

Of sixteen other reports of medical men who tried the calf virus, no less than thirteen seemed to have failed completely. Dr Gaillard, who succeeded 170 times out of 283 children with calf vaccine, succeeded 2740 times out of 2856 with Jennerian vaccine.

While thanking Mr Macdowall for his information, we venture to suggest that it would have been better if he had read a little more on the subject, when he might have saved himself the trouble of asking whether experiments have not been made to inoculate the cow with human smallpox. As his experience in Paris has given him a very poor opinion of animal vaccination, Mr Macdowall is fearful that this practice should be introduced into India, as he imagines that the natives would be more inclined to adopt it than to suffer vaccination from human lymph. We are not very sure about this. Perhaps the Hindoos would consider it a gross piece of cruelty that a calf should be tied up and tormented with sixty or seventy punctures in its teats; for they seem kinder to cows than to human beings; besides, we remember being informed by a Hindoo that the reason why they objected to being vaccinated was that they believed that, by successive vaccinations, their descendants would get to resemble oxen.

Dr Crisp's pamphlet contains some original observations and experiments upon smallpox and vaccination. We are content to take the opinion conveyed in the following remark:—"The evidence as to the propagation of syphilis is very incomplete; but it is not unlikely that when blood is introduced with the vaccine lymph (a very rare occurrence) that syphilis may be induced; but I cannot find any well-authenticated case recorded in this country."

It has been proposed, especially for those who are afraid of the contagion of some other disease being introduced by vaccination, that the crusts should be preserved and used instead of the lymph. There is no doubt that the crusts, if the air be excluded, can retain their virtues for years. In America the scab is generally used instead of the lymph. Medical men could thus easily keep a supply of vaccine matter derived from sources to which the most suspicious parent could offer no reasonable objection.

Dr Crisp believes that the sheep is the only animal besides man that is affected with genuine smallpox. "Smallpox in the sheep probably first appeared in England in 1710, and was described by Dr Thomas Fuller in 1730. Other outbreaks occurred in 1847 and 1862. I have had opportunities of studying this disease, and of examining sheep after death. The disease in many respects resembles human smallpox, and is quite as contagious; a diseased flock is said to have infected other sheep five hundred yards off. The pustules, as shown in the drawings, and in the model of the sheep's head on the table, are larger, and they remain for rather a longer period." Vaccination has been tried, without satisfactory results. Inoculation, as first shown by Hurtzel in France, and more recently by Messrs Marson and Simonds, reduces the mortality from 50 to 5 per cent. Professor Gamgee prefers isolation, believing that, as in human smallpox, inoculation serves to spread the disease.

Dr Crisp has tried to inoculate a large number of animals, including monkeys, with smallpox matter, but has always failed. He finds, from the Registrar-General's Reports from 1851 to 1860, "that of the 42,071 deaths from smallpox during these ten years, 26,102 were children under five years of age, and 35,007 under fifteen." Hence he is inclined to revaccinate at an earlier age than is generally recommended. Dr Crisp also remarks that, in the revaccinated, a person with one good cicatrix is not more likely to have cowpox than another with three or four. It is not, however, easy to throw discredit on the striking statistics of Mr Marson, quoted in Reynolds's "System of Medicine," showing that the mortality in those seized with smallpox diminishes with the number of vaccine marks. Dr Crisp made a number of experiments which show tubercle, or what is believed to be tubercle, is not produced in animals by inoculations from vaccine lymph, though he has succeeded in producing tubercle in the same animals by the inoculation of pus and other substances.

We now come to Surgeon-Major Atchison, who would fain lay hands on all who have smallpox, and, "without favour or distinction," convey them by a well-regulated ambulance to the nearest waste lands or commons. He prefers a high and airy situation, or near a river where there is a current of pure air. In such localities Mr Atchison would lodge his patients "in tents, thatched huts, wooden sheds, and any other movable apparatus suitable for the emergency," among which he mentions "thatched barges, unused steamers, or well-ventilated vessels at anchor." In this manner, Mr Atchison engages, "with one-fourth of the amount as yet expended, to provide for all who may become sufferers from smallpox in London," and, on the disappearance of the disease, to burn the camp to the ground. He would also establish a strict quarantine, especially against "the great disseminators of the poison—viz., the laundress, the communicative friend or relative, and the medical man, unless duly careful." "There are many subordinate details," Mr Atchison observes, "connected with the encampment of the sick *in this climate* which can easily be mastered by an energetic will." Yes, but there are a good many details which cannot—for example, a damp variable climate, north-easters, frost and snow, rain and sleet; and we would recommend the critics of the "British Medical Journal," "Medical Times and Gazette," and "Lancet," who have endorsed this preposterous proposal, to go and live in a tent, whilst they are yet in good health, for a few days at the four seasons of the year; and we venture to assert they will never again recommend the proposal of entrusting the sick to the care of the Surgeon-Major with his energetic will and Indian experience.

Mr Atchison talks of buildings used to lodge the sick as being sources of future infection. It is the custom of some writers to discourse in a vague way of hospitals being the cause of pyæmia and gangrene, and to assume that we would get rid of these dreadful maladies if the sick were lodged in tents or wooden huts; nevertheless, a very large proportion of the French wounded at the siege of

Paris by the Germans were lodged in temporary erections, and "yet the mortality from pyæmia and gangrene amongst the wounded and amputated is known to have been greater than has ever occurred before in the annals of military surgery." [1]

Dr J. Worms, the "Inspecteur of the Service Médicale" (Sanitary Commission), told me, says Macdowall, *vivâ voce*, that, "in round numbers, all the cases of amputation in the last few weeks of the siege died; that the case was the same with nearly *all* the wounded who were not operated upon; and that the deaths were almost all from *infection purulente*."

Dr Gruby, Mr Macdowall assures us, had not a single case of pyæmia and gangrene among his patients. His treatment of wounds consists simply of keeping them from the air by means of cotton-wool soaked in oil. So fearful is he of introducing germs upon exposed surfaces, that he is unwilling to wash them with water unless it has been previously boiled.

Mr Macdowall served as an unpaid volunteer in Paris during the siege, and his pamphlet is full of interesting information.

Dr Legat attributes the spread of smallpox in South Shields mainly to the neglect of the local authorities to carry into execution the Sanitary and Vaccination Acts. In common with most men acquainted with questions of public health, he despairs both of local boards and of local sanitary officers. He would have the central government to maintain an officer of health for each locality. "To attend to everything coming under the scope of the Sanitary Acts in force, requiring an intelligent and specially-trained officer, would constitute his duties. He should be a man, in my opinion, wholly free from the engagements and hindrances of private practice, so as to make him thoroughly independent in action." We cordially endorse the latter proposition. Local sanitary officers are often more to be blamed than local authorities, especially as they cannot always plead ignorance, like the boards which employ them. Practitioners in small towns and country parishes have rarely the courage to wage real war on nuisances.

The General Structure of the Animal Kingdom. By THOMAS RYMER JONES, F.R.S., etc. London: John Van Voorst.

THIS book is already so well known that any lengthened notice of it would be altogether superfluous. The fact that it has already passed through four editions is sufficient guarantee of its excellence. Written throughout in a clear and scientific manner, and yet with a freedom of style which is only too rare in books of this sort, this edition, like its predecessors, cannot fail to commend itself to the student of comparative anatomy. The perspicuity of the writing is fully equalled by the accuracy of the facts.

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[1] Macdowall, p. 12.

The only point which we think might with advantage have been changed in this edition is the classification. This, with due deference to the author's opinion, expressed in the preface, "that changes in classification are rather calculated to embarrass than to facilitate the progress of the student," we are of opinion is now somewhat antiquated, and apt to give rise to a certain amount of confusion in the mind of any one accustomed to peruse the later works on zoology and classification of animals. With this trifling exception, however, we can heartily recommend the "Outlines" as at present the best general text-book of Comparative Anatomy in our language.

On Dactylitis Syphilitica. By R. W. TAYLOR, M.D., Surgeon to the New York Dispensary. New York: F. W. Christern: 1871. Pp. 30.

THIS pamphlet is a reprint from the American Journal of Syphilography and Dermatology, and treats of an affection apparently little known, but yet, in all probability, not uncommon. The affection here called dactylitis syphilitica (from δακτυλος, a digit) is a chronic inflammatory or exudative affection of the subcutaneous connective tissue, ligaments, periosteum, or bone of the fingers or toes. The characteristics of the affection, as pointed out by Dr Taylor, are interesting. Though often resembling, in some of its stages, other affections, such as periostitis, paronychia, or exostosis, it differs in this important point that it is amenable to constitutional treatment. The worst that can come of this disease, if seen early and properly treated, is contraction of the digit from absorption of bone, or exfoliation of a portion, should suppuration have occurred. A very interesting series of cases is recorded by Dr Taylor, one of which occurred in his own practice, and drew his attention to the pathology and literature of the disease.

The paper bears the general characteristics of a carefully-prepared and well-written essay, such as we are in the habit of hearing read before our own Societies; and will be interesting to any one who, like the writer, has met with an illustrative case.

The Dental Profession: A Letter to the Editor of a London Newspaper. By a DENTAL SURGEON. London: Robert Hardwicke: 1871.

NOTHING could be more opportune than the publication of this letter. The subject discussed is one which must long have filled the mind of every legitimate practitioner with disgust,—namely, the assumption of surgical titles by individuals possessing neither surgical education nor diploma of any recognisable description. Dentists, of all other departmental practitioners, seem most guilty of this species of deception; and the explanation appears easy. In this branch of the profession, the danger to life is slight, and the probability of a conviction for manslaughter proportionately small. Pretenders to a scientific status thus find an opportunity of implying that they are surgeons or something akin, without entailing their ignorance being discovered.

In England this is more particularly the case, as is borne out by the puffing announcements of the charlatans who so often figure in the daily press. But even in Scotland—taking a very liberal view of the matter—certainly one half of all the dentists employing such a prefix as "surgeon" have no claim to it, unless it be accorded to those who are not surgeons at all. What of the Medical Act here?

Part Third.

MEETINGS OF SOCIETIES.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXX.—MEETING XIII.

Wednesday, 24*th May* 1871.—Dr BELL in the Chair.

I. CASES OF ADHERENT PLACENTA.

Dr Keiller exhibited a placenta with clots which he had removed from a patient on Monday morning last. He found that the placenta was not separated, and on introducing fingers to hook it down he found it adherent, and required to be detached. On its removal, a small portion was still left adherent, and on extracting the membranes he found that portion attached to them. The uterus did not contract satisfactorily, which might have been due to the chloroform, which had a marked effect on the strength of the pains. Ergot was given, but the patient lost a good deal of blood and ran a great risk.

Dr Cairns said the case reminded him of one he had lately been called to. The patient had been attended by a midwife, who stated that the afterbirth was all right, but subsequently severe hæmorrhage occurred, and was only stopped by the removal, several days after, of a portion of the placenta which had been left in the uterus and was protruding through the os.

Dr Rattray said that he expected to have been able to show to the Society a placenta the cord of which measured only 10½ inches, but it was too much decomposed to bring with him. In a previous labour the cord was found to be 13½ inches. The labours were easy.

Dr Bell agreed with Dr Keiller in the propriety of pushing the finger through the root of the cord to assist in its removal, when the cord was weak. He had often adopted this plan with success.

Dr Sidey said that he had recently had a case of adherent placenta, and referred to sacculated contraction of the uterus, which was generally found at the upper and back part of the womb.

Dr Keiller also mentioned a case he had had of large flattened adherent placenta without hæmorrhage.

Mr Pridie alluded to hour-glass contraction as a cause of retention of the placenta and hæmorrhage.

Dr Pattison said he did not believe in hour-glass contraction. In his younger days he thought he had met with it, but later experience had changed his views.

Dr Keiller could not see why we should not have so-called hour-glass contraction—the muscular fibres acting so as to cause contraction and retention of the placenta; but he thought that the name was unfortunate.

Dr Bell said his difficulty was to understand how a uterus 16 inches in circumference should contract so as to prevent the passage of the finger. He thought it was a wise provision that the cervix contracted in some cases even before the placenta was expelled, and in this way might cause its retention; but he could not understand how such a contraction in the body of the organ could take place, as the arrangement of the uterine fibres did not explain it, they being oblique, whereas in the cervix they are circular. There might be irregular contraction of the fibres on one side enclosing the placenta, but he doubted the occurrence of hour-glass contraction as it was generally described.

Dr Keiller observed that, while it was true that the fibres of the cervix were circular, the fibres of the fundus interlaced in all directions, and hence, by their contraction, after the removal of the placenta, hæmorrhage was prevented.

Dr Ritchie had recently had a case of adherent placenta, and in attempting to separate it, a portion remained in the uterus. It was separated with some difficulty; the patient lost a good deal of blood, but made a good recovery.

II. AN INSTRUMENTAL LABOUR, COMPLICATED WITH ADHERENT PLACENTA AND HÆMORRHAGE. BY DR CUTHBERT.

About 9 P.M., on the 16th April, I was summoned to see Mrs W., who was in labour with her ninth child. I found her in bed. Pains at short intervals and weak; os fully dilated; membranes unruptured, and the head above the brim. I also found the antero-posterior diameter diminished in consequence of a flattening of the pubes. Progress of labour very slow. I ruptured the membranes, and at eleven o'clock gave ergot, which, in about thirty minutes, improved the pains.

In her last confinement, Mrs W. was delivered of a very large child by the help of the forceps; and as she had suffered a great deal on that occasion, she besought me to use them now and relieve her. The child in the present labour was also very large; and I found that the head was making no progress, but remained immovable on the crest of the pubes. The labia and the soft parts generally were very much swollen and congested.

Being of opinion that it was necessary to use them for my patient's relief and safety, I introduced them about twelve o'clock. They were easily applied. When I got the head as low down as the perineum, I took them off. The head was born with some difficulty, but when the shoulders took up their position at the outlet, I had the greatest difficulty in getting them through. The right shoulder got hitched above the pubes in the same way as the head, and, owing to the extreme breadth of the chest, they were firmly grasped by the surrounding parts. I could scarcely get down an arm to release the infant. At length I managed to get the right arm born, which relieved the constriction, and the labour was soon completed. The child gasped several times before respiration was fully established, and, before securing the cord, I allowed a dram or two of blood to ooze away, which relieved the infant considerably. The child was very large. Waited half an hour, but the placenta did not come away. I then introduced my left hand, and found it adherent on the posterior wall of the uterus. It was carefully peeled off, and the whole mass was brought away. About a third of its surface was adherent. On withdrawing the placenta, a pretty smart flooding took place. I immediately gave a full dose of ergot, grasped the fundus firmly with my left hand, and applied cold to the vagina and over the region of the uterus. This was persevered in till all hæmorrhage ceased; after which the wet and soiled linens were taken away, and a binder with a compress applied. In about an hour after delivery a violent shivering, with quick gasping respiration, came on, and the patient complained of cold coming on suddenly, and extending along her legs, thighs, and body. On applying my hand over her knees and face, I felt them ice-cold. The pulse at the same time became quick and feeble; but there was no hæmorrhage. I gave her a wineglassful of whisky, which was repeated in fifteen minutes. A bottle of hot water and a hot brick were applied to the feet and legs; friction applied to the limbs; and more bedclothes heaped on. In a short time reaction set in; the pulse improved; and in three-quarters of an hour the attack had passed away. I left about 3 A.M., leaving my patient quite comfortable. Mrs W. made an uninterrupted recovery.

The following are the child's weight and measurements at birth: Weight, 12 pounds; length, 22½ inches; circumference of the shoulders, 18¼ inches; circumference of the hips, 14½ inches.

Remarks.—This case illustrates very well the value of the forceps applied early. There is no doubt that the flattening of the pubes and the great size of the child were the chief causes of the difficulty.

The head lay, as it were, hitched on the pubes, and from this position it would not move. The right shoulder was caught in the same way, and this of course was another source of difficulty. The swelling and congestion of the labia and surrounding parts, caused by pressure, also demanded immediate relief.

The shivering, with extreme cold, no doubt was caused by the shock to the nervous system. After tedious and complicated labours, the collapse is sometimes very great, and may even lead to fatal consequences if the patient does not speedily rally.

I have stated that my patient, in a previous confinement, was delivered by the aid of instruments. On that occasion, I believe there was also adherent placenta followed by severe hæmorrhage. A sketch of the history of the case has already been given to the Society.

In conclusion, allow me to remark, that it is easier to remove an adherent placenta with the left than with the right hand, especially when it adheres to the posterior wall of the uterus. This will appear more evident, if we remember that, as the patient lies usually on her left side, the axes of the pelvis and uterus are parallel to the bend of the left arm. I would therefore recommend practitioners, especially the junior members of the profession, to accustom themselves to manipulate with the left hand in cases of adherent placenta or in turning.

Dr Keiller remarked, that hitching of the head or shoulder on the pubes was a not uncommon cause of difficult labour. The shape of the woman had much to do with its occurrence, in cases, for instance, where the curves of the spine were very marked. It is important in such cases that the uterus should be supported to allow the head to enter the pelvis in proper position.

Dr Bell said that in introducing the hand to remove the placenta, much would depend upon its position. If placed posteriorly the left hand would be used more easily, and if anteriorly or laterally, the right.

III. ON POST-PARTUM DIETETIC TREATMENT. BY DR CAIRNS.

A few days ago, I was asked by the senior Secretary of this Society if I could furnish a short paper for this meeting, the reason being, I presume—although none was assigned—a dearth of matter. Having the interests of the Society deeply at heart, and bearing in mind that it professes to deal rather with practical than theoretical subjects, the after dietetic treatment of puerperal women immediately suggested itself to my mind as a subject of prime importance, and one likely to give rise to a considerable amount of interesting discussion between the elder and younger members of the Society. I accordingly selected that subject, and duly intimated to Dr Ritchie that I would do my best either to read or transmit a short paper upon it to the meeting of this evening. That paper I now respectfully submit for your consideration. But for a recent enactment, whereby the Society restricts members to certain limits in the reading of papers which they produce, I would have discussed the whole subject of post-partum treatment, including as well the use of binders, and the use of purgative medicines as articles of diet. Your new regulations, however, prevent this, and therefore I shall confine myself *almost entirely* to the simple treatment of diet, reserving the other parts for a future occasion.

To come now to the point under discussion, viz.:—"What is the *correct* and *common-sense* treatment of women in point of *diet after labour?*" The general answer to that question is this,—"Every parturient woman requires a dietetic regimen suited to her particular state and condition." That is to say, no absolute rule can be laid down applicable in all circumstances to all women without exception. For example, a woman after her confinement may not only have no desire for food, but a positive loathing of it, and to force her to take it in such circumstances would only be productive of harm instead of benefit, inducing in all probability acidity of the stomach, flatulence, and diarrhœa. Again, some women have very marked idiosyncrasies in reference to certain articles of diet. Some cannot eat an egg, others cannot eat beef, others mutton, etc., without producing very serious symptoms. While, therefore, I acknowledge that it were rash in the extreme to lay down any one invariable and fixed rule as to what kinds of food should be administered in puerperal cases, I humbly venture to allege,—Primo, *That the diet should be nutritious in point of quality.*

For several years past I have been in the custom of asking all my new patients, both in private and dispensary practice, what sort of food the "doctor" allowed them to eat after their confinement; and the invariable and uniform answer I have received to that question has been as follows:—"Oh, doctor, just the usual things." "And what things, may I ask, are these?" "Oh, just breadberry and water-gruel." This forenoon I asked a patient who has just come from the country—where she had been delivered of ten children, and who has now been delivered of her eleventh, still-born, owing to shoulder presentation, age of patient, and length of time allowed to elapse before medical assistance was called in—the very same question, which was followed by the usual answer, with this addition, that she was kept under that treatment for *ten* days during *all* her confinements; whereas in most other cases I have found it limited to the fifth or sixth day. Such treatment, I humbly maintain, is utterly inconsistent with the principles of obstetrical pathology. I wish I had time to inform the younger members of the Society the real meaning of the term "Labour," because I am certain if they knew what it actually expresses, they would at once perceive the necessity, on purely pathological grounds, of *feeding* and not *starving* their puerperal patients. The word "labour," however, in our own language, sufficiently expresses what a woman has to suffer in the act of parturition. During a pain the acceleration of the pulse, the profuse perspiration, the contorted features, and the agonizing cries, etc., of the patient are quite enough to convince even the veriest novice that she is *labouring* in a *manner* in which no *man*, however hard his struggles, *ever did* or *could* suffer as she does. This being so, consider the *waste* of *tissue* to which she is subjected *during* her confinement, and you *must see* that, unless that waste be supplied by proper and fresh materials, the patient's strength must necessarily be very much reduced below its normal condition; and should any untoward event happen to her in these circumstances, the prognosis must essentially be infinitely more unfavourable than if her system had been duly sustained by generous diet. On these grounds, I have always been in the custom of liberally administering to my puerperal patients the most nourishing food which their circumstances enable them to procure, such as soft boiled eggs, beef-tea, soups, chops, steaks, tripe, etc., with a glass of wine daily in addition, or, if the patients prefer it, a glass of ale or porter; and this treatment, I humbly aver, is based on sound pathological principles.

Secundo, *The diet should be small in quantity and frequently repeated.* During labour the digestive and assimilative powers are weakened, as well as other parts of the system, and to exhibit large quantities of food in these circumstances would be to entail upon the stomach a much greater amount of work than it is able to accomplish. That organ fulfils its duties better perhaps than any other organ in the human system, and just because it seems to know that if it fail in the discharge of *its* functions, every department of the great and mysterious laboratory contained in the human frame will be thrown into confusion and disorder. But, for the very reason now mentioned, the organ alluded to should be treated with especial leniency and kindness. It is so willing to work that it should never have devolved upon it even such an amount of work as itself is willing to undertake; it is so obliging and so apt to exceed its own powers that it should never be allowed an opportunity of doing so. Administer more than it can easily digest, and it will tax itself to the utmost to digest what remains in excess, when, after finding its efforts abortive, it either ejects the undigested articles by the mouth, or expels them by the gut, or allows them to remain and undergo fermentation—all of which is most unfair treatment to the stomach, and consequently highly prejudicial to the patient. I say, therefore, let food be administered in small quantities at a time, and at such intervals as shall have ensured the complete digestion of the previous diet.

Tertio, *The diet should be varied in kind and form.* Monotony is death, variety life, to the human soul. The eye tires in time of the sublimest spectacles, the ear of the sweetest music, and the tongue of the most delicious morsels. Even in health the richest viands, when continued from day to day, become unpalatable and even nauseous. A change of diet, in short, is indispensable to a proper relish for food and the maintenance of the appetite. And if so in a normal condition of health, how much more on a bed of sickness. In puerperal cases, therefore, common sense seems to suggest that, with the view of stimulating the appetite and imparting to the patient a positive relish for food, every advantage should be taken of the culinary art in dressing the same article in different forms, and when these have been exhausted, that one article should be substituted for another during the whole period of the patient's convalescence.

Dr Pattison asked when Dr Cairns began to give the nourishing diet?

Dr Cairns said, on the day of confinement.

Dr Keiller said that communications on the same subject had been read at the last meeting of the British Medical Association, and most of the speakers who took part in the discussion were in favour of the views contained in Dr Cairns's paper. The dietetic treatment should be regulated in accordance with the habits and circumstances of the patient. He thought that the sloppy treatment was fast going out.

Dr Menzies did not think the breadberry and water-gruel treatment was so much in vogue as formerly.

Dr Bell said that for thirty years he had followed one plan. Immediately after delivery, he gave a glass of whisky, brandy, or wine. In one case in which this had not been given, he had cause to regret the omission. He agreed in the propriety of keeping up the system, but much must of course depend on the habits and constitution of the patient. In most cases, he was in the habit of allowing butcher-meat and wine on third day. He referred to the case of the late Princess Charlotte, who sank from exhaustion consequent upon hæmorrhage. She had only water-gruel—no stimulants. In Shetland, he understood that a bottle of whisky was given to the patient immediately after delivery, which she was expected to drink in the course of her recovery.

Dr Sidey said that the state of the tongue, rather than the length of the labour, guided him in his dietetic treatment. The tongue was often dirty, even when the labour was easy. When the tongue is clean, diet of the kind recommended by Dr Cairns might be safely given, but the same would not do for the other class.

Dr Ritchie agreed theoretically with Dr Cairns's recommendation, but found that practically he frequently required to give a less nourishing diet, especially in those cases in which the tongue was foul.

SESSION XXX.—MEETING XIV.

Wednesday, 14*th June* 1871.—Dr BELL, *President*, in the Chair.

I. *Dr Rattray* exhibited A SMALL CALCULUS which he had extracted from the urethra of a boy, who had for some time previously suffered severely from spasmodic pain.

II. *Dr James Young* showed a specimen of CALCAREOUS MATTER which had been lodged in some of the bronchial tubes for some years, causing severe cough, but which suddenly ceased on the man having expectorated.

III. CASES OF PHLEBITIS AND FACE PRESENTATION.

BY DR CHARLES BELL.

So much has been said and written against lying-in hospitals recently, that I should have hesitated to bring again any cases treated in them under your notice, had I not been satisfied that the prejudices against such institutions were not well founded, and that the high rate of mortality in some of them was not owing to their inherent nature, but to their being overcrowded and ill managed. I repeatedly expressed this opinion to the late Sir James Simpson, who admitted that it was correct. After his remarkable philippic against maternities, in which he stated that their ordinary mortality amounted to 1 in 29, I asked him if he was aware of the statistics of his own hospital? He replied that he was not; and when I told him what they were, he expressed his surprise; and, at a subsequent public meeting, he corrected his former statement by giving the correct account of that institution at that time.

Being desirous of proving the correctness of my views, I took a deep interest in the Royal Maternity, to which I had been appointed one of the Ordinary Physicians, and I resolved to avail myself of the opportunity it afforded of carrying them into effect as far as possible, and it fortunately so happened that I had almost the sole attendance of the Hospital for nearly ten months consecutively, which gave me great advantage. But although I had the concurrence of Sir James Simpson, I found it no easy task to effect its improvement; as I met with strong opposition from some of those who had the management, or rather mismanagement, of the institution.

It would be difficult to imagine any public institution more disgusting and thoroughly mismanaged than the Royal Maternity was when I joined it. The wards were filthy in the extreme. The beds were not fit for human beings to occupy; the food of the patients was so bad and ill cooked that they frequently could not eat it. It was not remarkable, therefore, that the mortality should have been comparatively high, although it did not amount to what Sir James Simpson represented was the case in similar institutions.

Fortunately for the sake of Edinburgh and humanity, an active and judicious house committee was appointed, and soon established some admirable regulations, which were fully carried into effect by our excellent matron, Mrs Hay, who had had great experience in the management of such institutions, and, in consequence, a complete reformation was brought about in the appearance and comfort of the hospital, which was soon illustrated by the improved condition of the patients, and the remarkable diminution in the mortality, both among the mothers and the children. The maternal deaths diminished from 1 in 66 to 1 in 223; while the deaths among the children fell from 1 in 5·74 to 1 in 24. These beneficial results were, in a great measure, to be accounted for by the marked attention paid to the personal cleanliness of the patients, who were bathed with a solution of Condy's fluid twice a day after their confinement; and to their number being limited according to the size of the wards, which were regularly purified and well ventilated; and to the mothers being induced to suckle their children so long as they remained in the hospital.

These statistics form a favourable contrast, not only to what is reported of other maternities, but to the general results of private practice, which, if I mistake not, are stated by Dr Matthews Duncan to be 1 in 108. I am therefore justified in repeating the assertion, that the high rate of mortality in lying-in hospitals is not dependent on their inherent nature, but on their mismanagement. This fact appears to be strengthened by the consideration of the following table of the cases treated in the Maternity from the commencement of the regulations I have referred to until the end of December last, being a period of nearly fifteen months:—

Number of patients, .	223	Forceps cases, . .	8
Primiparæ, . . .	171	Turning „ . .	2
Multiparæ, . . .	42	Cephalotripsy, . .	1
Number of operations, .	11	Deaths, . . .	1 [1]

With these preliminary observations, I shall now relate a few cases which came under my observation many years ago; and as they give an illustration of phlebitis, a disease of rare occurrence, except in hospital practice, I think they may be interesting to the Society.

Case of Phlebitis.—Mrs Cousins, aged 30, a large flabby woman, having a very unsettled expression of eye; was delivered of her third child, a girl, on the 20th November, after a natural and rapid labour, being at the full period of gestation. Immediately after the expulsion of the afterbirth there was considerable hæmorrhage, which continued to come away for two hours in a small stream, notwithstanding that two drachms of the ergot of rye were given, and vinegar and water were injected into the vagina.

She stated that for two months previous to her labour coming on she had severe pains every Thursday afternoon, which led her to think that she was going to miscarry, until she found that they gradually went off; and this being Thursday she was under the impression the same result would take place.

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[1] This occurred in a primipara, who had been in labour for five days previous to her admission to the hospital, and exposed to frequent examinations. She had a small pelvis, and the position of the fœtal head was very obscure at first.

22*d Nov.*—Was seized with severe rigors at 4 A.M.; pulse 100 and very intermitting; no pains. She had three grains of calomel and five of antimonial powder in hot gruel.

9 A.M.—Had slight pain on pressure above the pubes; pulse 120, more regular.

8 P.M.—Pulse again intermitting; no pain; bowels freely moved.

24*th Nov.*, 10 A.M.—Complained of severe pain in her left leg, in which she had formerly suffered from varicose veins. On examination the saphena major was found much enlarged, hard, and painful to the touch, particularly at the calf of the legs and the middle of the thigh.

Four leeches were applied to this part, and the whole limb was enveloped in a linseed poultice for some hours, and when the poultice was removed the liquor plumbi acetatis was applied. She became much exhausted towards evening in consequence of her bowels being frequently moved.

25*th Nov.*, 8 A.M.—The pain much increased, and the swelling had extended up the limb; pulse 120, less intermitting. Eight leeches were applied along the course of the vein, and after they came off a linseed poultice was applied, and she had ten grains of Dover's powder in warm gruel.

At 4 P.M. she was again attacked with rigors, and became quite delirious. When she spoke her tongue appeared to be too large for her mouth, and her lips were much distorted. To have six grains of calomel and four of antimonial powder in gruel.

At 10 P.M. Dr Rigby ordered her to have three grains of camphor and five of hyoscyamus.

26*th Nov.*—She vomited the camphor and hyoscyamus, but she had some sleep during the night, and she spoke more coherently. There was less pain in the leg, but she complained much of her wrist, which was slightly inflamed. Her eyes were much suffused; tongue was coated with a whitish slimy fur; pulse 100, and weak; passes her stools involuntarily. To have the camphor and hyoscyamus pills every two hours.

6 P.M.—More delirious; her eyes more inflamed; bowels freely moved. She seemed to have no pain in her leg, but her wrist was acutely painful. Pulse full and soft. Dr Rigby ordered her to have half a grain of the acetate of morphia and one ounce of camphor mixture every two hours until sleep was procured; and to have four grains of gray powder and the same of Dover's powder at bedtime.

At 9 P.M.—Pulse 64, very weak; skin cold. She was much inclined to talk and pick the bedclothes. To have three grains of camphor; to be repeated if the pulse did not improve.

27*th Nov.*, 2 A.M.—Has had the camphor once, and the morphia twice, and she was in a state of great excitement, requiring two nurses to hold her in bed. It became necessary to put her in a strait-waistcoat, after which she fell asleep.

At 2 P.M.—Has just awoke from a sleep of nine hours. Pulse very feeble; eyes suffused, and speaks indistinctly. To have sago and wine.

About half an hour after last report Dr Rigby saw her, and ordered her to have brandy and an egg beat up together, and to continue the camphor and hyoscyamus.

Dr Hugh Lee saw her about an hour after, and ordered the brandy and egg to be omitted, and that she should have twelve leeches applied to the temples. The result was, she immediately sank into a stupor, and died at 9 P.M.

2. *Case of Phlebitis.*—On 15th December Sarah Masterman, aged 23, a well-formed, florid-complexioned, unmarried woman, was delieved of her first child, a small boy, apparently in the eighth month; she having menstruated in the beginning of April. Her labour was rendered tedious from the head presenting in the fourth position.

17*th Dec.*, 10 A.M.—She has had no complaint except that she has had a cough, which came on before labour, until this morning, when she had a severe rigor, followed by pain above the pubes. On examination the uterus felt large and tender; skin hot; pulse 107, small and compressible; tongue clean and moist; bowels moved by castor-oil yesterday; lochia scanty; milk plenty.

A linseed poultice to be applied to the abdomen, and to have three grains of calomel and five of antimonial powder, to be followed in four hours by a dose of the saline mixture.

9 P.M.—She feels better, and has less pain on pressure. Perspiring freely. Bowels moved after taking three doses of the saline mixture.

18*th Dec.*, 8 A.M.—The pain in the abdomen quite gone, and she only complains of cough. She, in consequence, unfortunately got out of bed and sat for some time.

4 P.M.—Is now suffering from pain in her right groin, extending down the thigh in the course of the saphena vein, which is exceedingly tender to the touch. Twelve leeches to be applied to the most painful part; after the leeches come off a linseed poultice to be applied to the abdomen and thigh. To have two grains of calomel and five of antimonial powder.

19*th Dec.*, 10 A.M.—Has no pain.

4 P.M.—Her cough has become very troublesome, and is accompanied with bloody expectoration. She complains of great breathlessness. Pulse 120, small and resisting; face flushed; tongue clean and moist; skin hot. To be bled to the extent of twelve ounces. To have one grain of calomel and five of antimonial powder, and in two hours after to begin to take the eighth of a grain of tartar emetic, to be repeated every half-hour, in solution.

11.36 P.M.—Perspiring profusely; has less cough and breathlessness. To continue the antimony while awake.

20th Dec., 7 30 A.M.—Has passed a pretty good night, and has less difficulty in breathing. Cough less frequent. Bowels freely moved. Pulse 84, feeble, and she feels weak; tongue clean and moist; countenance pale.

11 A.M.—Bowels again moved, but she has not passed water since yesterday. The catheter was introduced, and a small quantity of high-coloured urine was drawn off. On using the catheter, the right labia was observed to be considerably swollen, and the vagina and uterus were tender to the touch. There was also slight pain on pressure along the course of the saphena vein. The vagina was washed out with hot water, and a poultice was applied to the abdomen and labia. To have a powder containing five grains of Dover's powder and two of calomel immediately, and the same in four hours. The tartar emetic to be continued every two hours. A blister to be applied to the chest.

4.30 P.M.—Complains of great pain on the right side of the abdomen, immediately above the ilium, with considerable tenderness on pressure. She has less uneasiness in the chest, and she breathes more freely, and her cough is less troublesome. Tongue clean; pulse 120, rather sharp. To have the vagina washed out with a decoction of camomile flowers. A mustard poultice to be applied to the abdomen, and the part afterwards to be rubbed with mercurial ointment, and then to have a linseed poultice applied. To have two grains of calomel every four hours, and the solution of tartar emetic every hour.

8.30 P.M.—In a moderate perspiration. Has less pain in the abdomen, which she can allow to be pressed. Pulse 128. To have the vagina washed out with a decoction of poppy-heads. The medicine to be continued.

21st Dec.—As her bowels were much relaxed, she had five grains of Dover's powder early in the morning. In the course of the day she had four grains of calomel in divided doses. She was quite free from pain and cough, and she had passed urine freely. After taking the Dover's powder her bowels were not moved until the evening, when they acted once. To have the abdomen again rubbed with mercurial ointment and the other treatment continued. To have arrowroot for supper.

22d Dec.—Her gums slightly affected with mercury, but has no complaint. Bowels have been four times moved during the night, and she is weak in consequence. To have five grains of Dover's powder and four of gray powder, and arrowroot for diet.

She rapidly improved, and left the hospital in good health on the 31st December.

An Anomalous Case.—Jane Crow, aged 19, a thin, delicate-looking girl, with a very sallow complexion, was delivered of her first child at the full period of gestation on the 1st January, after a comparatively easy labour, the head being in the first position.

On the 3d day after her confinement she had a slight rigor, followed by severe headache, which was relieved after taking a dose of castor-oil. She had no other marked symptom, except that her pulse kept above a hundred, and she spoke in a hurried and unnatural manner. When asked how she was, she always said she was quite well.

On the 10th day she got out of bed and went into the convalescent ward; but she soon became weak, although she made no complaint, and she seemed to have no pain.

On the 12th day her left arm became inflamed above the wrist, and she soon became quite incoherent, and she died on the 14th day. The friends would not allow an examination.

Face Presentation.—Mrs Cochrane, aged 19, a strong, healthy-looking woman, residing in Blackfriars Wynd, was seized with severe pains on the 12th January, and being at the full period of gestation, she was induced to believe that her labour was coming on, and sent for one of the pupils of the Royal Maternity, who, finding that the pains were spurious, left her, with instructions to send for him when the true pains came on. He did not return until the following evening, when the pains were lingering and ineffectual. He, however, remained with her for some hours, and then sent for one of the house-surgeons, under the impression that it was a breech presentation, and that the first stage of labour was completed. But when the house-surgeon arrived he ascertained that the head presented, and that labour had just commenced. The error in diagnosis arose from the womb being much anteverted and the head being felt through its anterior walls, and mistaken for the breech. He gave the patient thirty drops of laudanum, which allayed the spurious pains. True labour-pains did not come on until the evening of the 15th, when it was discovered that it was a face presentation, and the forehead soon became impacted in the arch of the pubes, which was narrow and angular like that of the male.

Such was the state of matters when I arrived, between five and six o'clock on the morning of the 16th. I immediately recommended the application of the forceps; and the patient being put under chloroform and her urine drawn off, the house-surgeon endeavoured to apply them, but without success. I then introduced them, but they slipped—an accident which had never occurred to me before, nor has it ever done so since. It arose from my being thoroughly exhausted from having had a severe and arduous instrumental case only a few hours before, and being at the time suffering from illness. I again introduced the instrument, and after great difficulty delivered the child. The skin under its right ear was lacerated, and did not heal kindly.

Having waited for twenty minutes in hopes that the afterbirth would be expelled, and feeling the womb considerably contracted, I recommended the pupil to examine if it were not in the vagina, when he found it was still in the uterus. After waiting some time longer, I examined and found the os uteri closely contracted round the cord, so that it was impossible to reach the placenta, which was in the uterus. With much difficulty the contraction was at last overcome by gradually insinuating the hand, in the form of a cone, through the os, when the placenta was found adhering throughout its whole extent, and the adhesion was so strong that it was necessary to tear it off piecemeal; and, notwithstanding my utmost efforts, I was obliged to leave a large portion still adhering, which was expelled without hæmorrhage on the fourth day.

The patient did well for twenty-four hours, when rigors came on, and they were soon followed by pain in the abdomen and headache, and the pulse rose to 125. These symptoms continued, along with incontinence of urine, for some days; but they ultimately yielded to the use of five-grain doses of Dover's powder every six hours, and mild aperients; so that in three weeks the patient was able to get out of bed, and soon after resumed her employment of itinerant dancing-girl, travelling about the country with her husband, who acted as her musician. There was slight laceration of the mucous membrane of the vagina, but the perineum remained entire. The child died on the ninth day, the laceration in its neck never having healed.

This case appears to me to be interesting from its unusual complications and the great difficulty there was in delivering the child in consequence of the peculiar deformity of the pelvis. It also shows that in some cases considerable portions of the placenta may be left adherent with impunity; at the same time, this ought never to be done if it can possibly be avoided. In this case it was quite unavoidable from the firm adhesion, which could not be overcome without the risk of injuring the womb. I therefore incurred the risk of hæmorrhage, at the same time instructing the student in charge of the case to watch the patient carefully.

Dr Cochrane remarked, that in cases where there was difficulty in introducing the hand, he found that an opiate was of great use. He had never found it necessary to leave any portions of the placenta in the uterus, during the course of a long practice.

Dr Gordon thought the uterus could be more readily acted on by chloroform, and that the contraction would be overcome more easily by it than by opium.

Dr Thomson said that eighteen months ago he had a very interesting case at the seventh month. The placenta was retained by strong contraction of the uterus. An opiate had been given more than once in the progress of the case. The contraction gave way readily when the patient was put under chloroform. He had several times been so unfortunate as to leave pieces of the placenta in the uterus. He had once met with a case of hour-glass contraction which prevented the placenta being removed for a long time. It was so adherent that it could only be taken away bit by bit. The hæmorrhage was very great.

Dr Gordon said that in some cases it was occasionally necessary to leave portions of the placenta, and quoted the advice of an old Edinburgh teacher: "That we should separate all that was separable."

Professor Simpson thought that in those cases where there was adherent placenta there was less danger than when a portion separated in the womb, for it is still in a vital state whilst adherent.

Dr Burn thought that portions of the placenta which were left in the uterus, and which were not afterwards accounted for, came away when the patient was at stool. He narrated a case of adherent placenta where the patient took phlebitis with protrusion of eyeball, and died. He had also seen cases where no injury resulted from portions of placenta being left.

Dr Bell, in his reply to the observations made on his paper, stated that on post-mortem examination he had found the uterine veins filled with pus.

IV. *Professor Simpson* showed an EPITHELIOMATOUS MASS which had been removed from the cervix uteri of a patient, with the following history, which had been drawn up from the Infirmary journal:—

"H. B., aged 40, was admitted to Ward XIV., Royal Infirmary, 22d May 1871.

"*Previous History.*—Began to menstruate at 15. Married when 19 years old. She has had seven children at various intervals. Has never miscarried. Her labours have always been easy—natural, and at full term. Six weeks after her sixth confinement she suffered from inflammation of kidneys and general anasarca; from this she made a complete recovery within three weeks. With this single exception, she has enjoyed perfect health during all the twenty years of her married life.

"Her last confinement took place on 29th December 1870 (five months ago). She made a perfect recovery, and in a fortnight was able to attend to her ordinary duties.

"About six weeks after, she began to complain of a dragging, uneasy pain in the left side, accompanied by a thin glairy discharge from vagina, having a most disagreeable smell. She presumed she suffered from an attack of 'whites,' and paid no attention. The discharge became, however, much thicker in consistence, and enormously increased in quantity, the smell at the same time being much more offensive. She suffered from constant dyspepsia and vomiting. Occasionally she observed that the discharges from the vagina assumed a brownish colour, and at intervals of ten days she had a sanguineous discharge lasting from one to three days. She consulted Dr Robertson of Bannockburn, who sent her to the Royal Infirmary, to be treated by Professor Simpson.

"*Examination on admission.*—Patient is somewhat over middle height, well made, slightly anæmic. On examination, heart and lungs are found normal, complains of great weakness and constant pain extending from left groin to lower margin of ribs; appetite bad; bowels very constipated. Has nursed her infant regularly. Has a constant muco-purulent, exceedingly offensive discharge from vagina. On digital examination per vaginam, a hard, nodulated, irregular mass was found attached to the cervix uteri, encircling the whole os uteri except at one point, and separate from the roof of the vagina by a narrow margin of healthy mucous membrane. The tumour felt about the size of an orange. Patient complained of much pain during examination. On withdrawing finger it was found covered with blood. On introducing a Sims speculum, vagina is red and congested, covered with a yellow fœtid discharge, and at intervals streaked with blood. Tumour already mentioned is found to be of a bright red colour, irregular surface, small unequal lobules projecting here and there. The introduction of speculum was accompanied by a sanguinary discharge.

"Patient ordered tinct. ferri muriat., and a solution of permanganate of potass to be injected night and morning. Bowels to be acted on freely. Nursing to be discontinued, and extract of belladonna dissolved in glycerine to be applied to the breasts.

"*30th May.*—The milk has entirely disappeared from the breasts.

"To-day, patient being placed in lithotomy position and anæsthetized, Professor Simpson, by means of a wire ecraseur, removed the tumour. There was a smart hæmorrhage, which was at once checked by means of pledgets of lint soaked in a solution of perchloride of iron in glycerine. *Vespere.*—Pulse 100. Patient dozing. Complains of no pain.

"*31st May.*—The plug of lint removed this morning. No hæmorrhage; pulse 95. Took a good breakfast; feels well. Vagina to be syringed with Condy's fluid and water.

"Patient continued to progress favourably until 5th June (seven days after operation).

"*5th June.*—After rising to stool, she had a severe rigor. In evening her pulse 130, full; face flushed; skin hot; much thirst. Has had two attacks of vomiting; complaining of much pain and tenderness over abdomen. Is unable to pass urine, which had to be drawn off with a catheter. Ordered ¼ gr. morphia every three hours; turpentine enema and turpentine stupes over abdomen.

"*6th June.*—Pulse 140; pains over abdomen still acute. Abdomen to be blistered with liquor vesicatorius; morphia pills to be continued. Can pass water without catheter. *Vespere.*—Pain somewhat less over abdomen; pulse 120. Has slept for three hours; feels much refreshed, and easier.

"*7th June.*—Pulse 98; pain in abdomen much relieved; passed a good night."

Dr Simpson examined the patient to-day, 14th June, fifteen days after the operation, and found the surface of the wound granulating. As there were some suspiciously prominent points scattered through it, he had brushed it freely with solution of perchloride of iron. Her general condition was decidedly improved, and the arrest of the discharge from the fungating mass, even though it might prove to be but temporary, he regarded as an immediately beneficial result of the operation. In such cases he had frequently removed portions of cancroid tumours from the cervix uteri, where he knew that the whole affected portion of the organ could not be extirpated, with the happy result of arresting for a time the progress of the disease and checking the exhausting discharges, which must otherwise have speedily dstroyed the patient's health. Sir James Simpson used occasionally to dig out with his nail the cancerous masses in some of the excavating forms of malignant disease of the cervix uteri; and Professor Simon had recently written a paper relating some interesting cases where he had followed a corresponding practice of digging out the morbid deposits with a scoop or curette. The result was that a healthy granulating sore was substituted for a bleeding cancerous surface; and though the disease returned eventually, yet the benefit for the time to the patient's health was very marked, and her life was prolonged perhaps for months.

Dr Thomson thought the removal of such a mass must be very important, and fully warranted, as making the patient more comfortable even for a time. In a recent case of cauliflower excrescence which he had seen, it was too late to remove the whole, but by picking away portions by the nail, and applying perchloride of iron, the hæmorrhage, which previously had been great, was stopped even till time of death.

Dr Gordon submitted that his instrument for rupturing the membrane, if modified at the point, would be better suited to remove portions of tumour than the nail.

Dr Burn said Sir James Simpson had a small instrument which he used for scooping off portions when removal of the tumour could not be effected. When the hæmorrhage was from vegetations he had frequently scraped them off with success.

Drs Gordon and *Young* alluded to the wire Dr Simpson used.

Dr Young thought it merely would cut through and not bruise so much as the chain, and so cause more bleeding.

Dr Simpson replied.

Part Fourth.

PERISCOPE.

THE following is an abstract of a lecture delivered by M. Verneuil on the subject of the first services to be rendered to the wounded:—

This lecture is specially addressed to the young surgeons employed on the ramparts, in the immediate vicinity of the fighting. Their position is a very difficult one, as the cases will be new to them, as gunshot wounds are so rare in civil practice. Destitute of experience, deprived of the counsel of their teachers, without leisure for reflection or for reading, they will doubtless be in difficulty without some programme for their guidance. We wish to tell them what they should do and what they should leave undone.

Two chief classes of injury will come under your notice. 1. Wounds usual in daily hospital work—such as fractures, bruises, dislocations, wounds with knives, swords, and bayonets. 2. Gunshot wounds. These are less familiar, and it is of the nature and special characters of these that I wish to speak. They resemble contused wounds, but with exaggeration of all the injuries—extensive bruising of the tissues, complicated fracturing of the bones, tearing and crushing of the soft parts; sections with loss of substance, of nerves, and vessels; large openings into visceral or articular cavities; injuries, often hardly visible on the surface, but extensive and irreparable in the deep parts; foreign bodies are present, bullets, splinters, fragments of clothes, etc. The surfaces of such wounds are unfit for immediate union; without being poisoned, as used to be believed, they are almost inevitably destined to excessive inflammation, suppuration, and will heal only after the separation of extensive sloughs. Five different divisions will easily be recognised under which these wounds may be classed.

1. Gunshot wounds affecting the soft parts only. 2. Wounds with fractures of bones. 3. With foreign bodies. 4. Complicated by hæmorrhage. 5. With much injury to parts, large loss of susbtance, and complete or partial separation of a limb.

Before examining the rules to be observed in treating each of these, let us examine the resources we have at command. These are limited, and your economy and ingenuity will be required to supply deficiencies. You will have to do much with little—to utilize everything that comes to hand. It is your duty to perform the first services to the wounded—to apply the first, but only temporary, dressings to protect the wound—to support the fracture, to calm suffering, and to prevent immediate complications—in a word, to facilitate transport to the rear and to the hospitals, where the principal operations will be performed. These operations you must not perform, for the following reasons: 1. Because they are difficult, and, for the most part, require a skill which you do not possess. 2. Because they are tedious; and you must keep the wounded at the front as short a time as possible. 3. Because great amputations should not be done at once, but postponed to the moment when the first shock is being followed by reaction. 4. Because the determining whether to save the limb, amputate or excise a joint, demands careful examination and much experience. Do not, then, be tempted to operate. To return to the first dressing:—charpie, linen bandages, and splints are needed. Husband the charpie; when it is done, use carded cotton, without regarding the prejudice that cotton is hurtful to recent wounds. When cotton fails, cover the wound with plaster, or even with fresh leaves—indeed with whatever you can get that is least irritating. For compresses, when they fail you, use the patient's clothes, shirt, etc.—indeed, anything soft and pliable that you can get. To fix the dressings you have bandages; when they are exhausted, tear up napkins, shirts, even coats—specially use handkerchiefs. Folded in triangle, in square, in a rope, the handkerchief will do for compress, bandage, or sling; and if you practise yourselves in their use, as taught by Mayor, Rigal, and more recently by Esmarch—for whom, though in the ranks of our enemies, I retain every respect and friendship—you will find their value. You will need to put up fractures; but you will have no splints, no bandages of Scultetus, no dextrine, no plaster—nothing but pads and pillows. You will require to improvise everything—napkins, pads, splints of straw rolled up to the thickness of the wrist: handkerchiefs and slings will suffice for most fractures of the upper extremity.

If you are destitute of bandages, you may fear that you will be still more destitute of medicines and topical applications. I may reassure you on this point. The best of all topical applications for recent wounds is, fortunately, always at your service—I mean cold water; you need neither wax nor ointments. I will again speak to you of hæmostatics, and of medicine which may be given internally; but I repeat, that pure cold water, in recent wounds, is the best of all local applications.

You will apply your first dressings as far as possible in the places arranged for the purpose. When several wounded come in at once, you must make a selection. The less seriously injured must sit down or lie on straw arranged for the purpose. The more seriously injured should be placed on beds, and obtain your first attention. In cases where the dressing may have to be tedious or painful—or if a small operation or ligature of a vessel is necessary—you will place the patient on the operating-table. Wherever the situation will allow it, you will place the operating-table in a sheltered or isolated spot, in order that those already dressed, or those waiting their turn, may not see your work nor hear the cries of their comrades. As far as possible, get rid of the traces of one dressing before beginning another—such as blood, soiled linen, clothes, limbs, etc. In a word, attend to the *morale* of your patients. Occasionally you will have to dress the patient on the rampart itself, when it may happen to be far from your post. In such a case, you must place the patient in as comfortable a position as possible, seated or recumbent, making use of any inequalities of the ground, and improvising a couch if possible.

You will have to work by night as well as by day—in wind and rain as well as in sunshine. You will take great care to preserve the wounded if possible from long exposure to cold—covering as quickly as possible the part you have stripped for the dressing.

With these general rules, let us go on to the treatment of special injuries.

1. *Simple contusions.*—Cold applications, with a gently supporting bandage. Fix the limb if movement is painful.

2. *Simple fractures.*—Immediate reduction, and application of suitable retentive apparatus.

3. *Dislocations.*—Attempt immediate reduction, which is generally easy, then fix the limb.

4. *Incised wounds.*—Simple bandages; if they are narrow and superficial, reunion by plasters; aided by position of the limb, if they are deep or gaping. Do not attempt too careful union, as movement will destroy it; specially be sparing of stitches. These can be better managed at the rear. Remember that union by first intention succeeds better some hours after than at first.

5. *Gunshot wounds of soft parts only.*—These are often simple enough, at least for a time. Cover them with a simple dressing, making no attempt to close them. Avoid all examination for diagnostic purposes; do not put in probe or sound, not even the finger. If the opening is single, the ball is probably still in the wound. Do not try to be certain, you will only cause pain and lose time.

6. *Gunshot wounds with injury to bones.*—Treatment depends on the bone injured. If it is cranium, or face, or spine, or sternum, ribs, or pelvis, you can do nothing beyond applying a simple bandage. If a limb is injured, you can do more; you will endeavour studiously to fix the limb and prevent movement.

7. *Gunshot wounds with foreign bodies.*—Such cases are common. The ball has gone through, but left pieces of cloth, of bone, etc., in the wound, which are evidently hurtful if they remain. But remember that their extraction is always laborious, and rarely required at once. I advise you to be cautious in attempting it. Before applying the first dressing, remove all fragments that are distinctly visible and accessible. If you see a ball just under the skin, cut down on it and remove it. But except in very simple cases let them alone. To extract deeply-seated foreign bodies, operations are necessary which require experience and suitable apparatus. It is less dangerous to leave a foreign body in a few hours longer, than to make unsuccessful attempts at its extraction. I formally

forbid you to make any attempt to extract balls from cranium, chest, or abdomen.

8. *Gunshot wounds with hæmorrhage.*—Here I must change my language, and advise you, on the other hand, to interfere promptly, energetically, and radically. Hæmorrhage is one of the most common causes of sudden death on the field. It used to be thought that bullets respected large vessels. This is an error. The greater the danger is, so much the more must you be prepared to meet it. Cases vary. You may find a hæmorrhage spontaneously arrested by fainting; but you may learn its existence by the pale, feeble patient, the miserable, thready pulse, and blood on clothes and ground. Be ready for its recurrence; take every precaution in raising, dressing, and removing the patient. Have a compress on the wound and on the suspected vessel. Sometimes you must proceed to arrest the bleeding at once, specially if the blood is flowing at your examination. Whenever you have access to the bleeding spot, put on a ligature, however small the vessel may be. If the oozing is slight, if it comes from a deep or an unknown source, fill the bullet track with charpie. Cover the orifice with compresses, and secure everything with bandages, pretty tightly applied, and soaked in cold water. If the hæmorrhage is severe, and from an unknown vessel, check it by digital compression of the wound, by the hands of intelligent assistants. Use the respite to compress above the wounded spot by a tourniquet, and then tie the vessel in the wound, if possible, or if not at a suitable distance above. To reach the vessel incisions will be necessary. If at the wound, tie the vessel above and below; and remember the ends of the vessel, if divided, may be distant from each other. To tie an artery is often difficult; it will need all your thought, care, and anatomical knowledge; and all your efforts may be vain, if a great vessel is wounded high up, or in one of the cavities. I cannot leave this subject without cautioning you against a dangerous practice, too often used. We often see wounds which have been stuffed with charpie soaked in perchloride of iron. This agent absolutely prevents immediate union, sets up severe inflammation, and quite prevents future ligature. It may be useful in secondary hæmorrhages from small vessels, but is so hurtful to fresh wounds, that I absolutely forbid it. Its use is always questionable. If the vessel is large, it is useless; if it is small, cold, compression, any other agent, is equally successful and less dangerous. I hope you will not commit the error of soaking wounds with this detestable drug. You will find other less dangerous applications at your service, such as pure alcohol, Pagliaris styptic, etc. These I do not recommend, but I condemn them less energetically. They are useful in cases where bloody oozing escapes from small vessels in a large wound.

9. *Extensive laceration, bruising, or separation of limbs.*—Cannon-balls, large bullets, shells, explosions of mines, cause accidents only

to be compared to steamboat or railway explosions and collisions. If the great cavities are opened, death rapidly occurs. In such cases you may use chloroform to soothe agonies. If a limb is adhering only to a morsel of skin or flesh, you may separate it. Amputation must be performed, but the patient is not yet fit to bear it. Content yourselves by tying the great vessels on the surface of the irregular flap, cover the flap with a dressing, and send the patient to hospital.

Here I stop, though with regret, and if you appreciate what I have said, you will manage satisfactorily the first and necessary dressings. But you will need to attend to the general condition as well as to the wounds of the patient. Fatigue, hunger, pain, terror, will demand internal remedies, such as soups, wine, pure or mixed, and cordials. Those who suffer, who cannot sleep, or who are excited, will need opium; five or six drops of laudanum or wine of opium will calm them. Repeat the dose in an hour. If you find your patient intoxicated, as is not uncommon, you will give an emetic, and then give ether or hot soup, if you can procure it.

Gentlemen, I have told you your duties, and am convinced that you will surpass my expectations, and fulfil your duties with zeal, devotion, intelligence, and punctuality. We shall expect in you that personal courage in which Frenchmen are never deficient. Your posts are dangerous; you will partake the perils of the combatants. You will practise humanity in its fullest sense; you will, perhaps, have to assist enemies as well as friends. If you were armed you would fight without pity; but as surgeons you must know no hatred for him who has fallen, and has a right to your compassion. You must also show brotherly kindness to each other, and the discipline which knows obedience to law and to those in power.

On all these points I am full of confidence in you. Parisians, in fact or of necessity, you will show to all that the children of the great town, who are called careless and frivolous in peace, are brave in danger, strong in misfortune, and indomitable in the performance of those duties which the welfare of their country demands.—*Gazette des Hôpitaux*, No. 122, 1870.

On the Antagonism between the Actions of Physostigma and Atropia.—The subject of the antagonistic action of poisons has been most instructively handled by Dr Thomas R. Fraser, in connexion with the two drugs referred to, in a paper read before the Royal Society of Edinburgh, and published in their Proceedings. In this paper, to which we refer for details, he conclusively proves, that while there is a successful antagonism between the two poisonous drugs referred to, this antagonism is limited. To determine this accurately, "a large number of experiments were made, by which the region of the successful antagonism of fatal doses of physostigma has been defined with considerable exactness. The smallest and the largest doses of atropia that are able to prevent death after the administration of different fatal doses of physostigma, and the maximum fatal dose of physostigma that is capable of being rendered non-fatal by atropia, were ascertained, and it was found that beyond these various points death may be produced by combined doses of the two substances, either by some non-antagonized action belonging to one or other of them, or by a combination of similar actions belonging to both. . . .

"In one portion of this investigation, experiments were performed in which physostigma was given five minutes after atropia, both substances being injected under the skin. In the first series, the dose of physostigma was the minimum fatal, and the doses of atropia ranged from one that was too small to prevent the lethal action of this dose of physostigma, through a number of gradually increasing doses of atropia that were able to prevent death, until a dose was found whose administration resulted in death. Similar series of experiments were made with doses of physostigma one and a half times, twice, two and a half times, thrice, and three and a half times as large as the minimum fatal. With the minimum fatal dose of physostigma it was found that, while ·01 grain of atropia is too small to prevent death, ·015 grain is able to do so; and that, with any dose ranging from ·015 grain to 5·2 grains the lethal effect of this dose of physostigma may be prevented; while if the dose of atropia be 5·3 grains or more, the region of successful antagonism is left, and death occurs. With one and a half times the minimum fatal dose of physostigma, successful antagonism was produced with doses of atropia ranging from ·02 grain to 4·2 grains; with twice the minimum fatal of physostigma, with doses of atropia ranging from ·025 grain to 3·2 grains; with two and a half times the minimum fatal of physostigma, with doses of atropia ranging from ·035 grain to 2·2 grains; with thrice the minimum fatal of physostigma, with doses of atropia ranging from ·06 grain to 1·2 grain; and with three and a half times the minimum fatal dose of physostigma, with doses of atropia ranging from ·1 grain to ·2 grain. Successful antagonism could not be obtained above this dose, and, accordingly, three and a half times the minimum fatal dose of physostigma would appear to be about the largest quantity whose lethal action may be prevented by administering atropia five minutes previously.

"A similar series of experiments has been made, in which physostigma was administered five minutes before atropia, and the results were essentially the same, excepting that the region of successful antagonism was found to be more limited. . . .

"After defining the superficial area and the thickness of the region of successful antagonism, it seemed of interest to ascertain what dose of atropia is required to produce death with a dose of physostigma below the minimum fatal. The experiments performed for this purpose show that when one-half of the minimum fatal dose of physostigma is given five minutes after atropia, so large a dose of the latter substance as 9·8 grains is required in order to cause death—recovery taking place with doses ranging from 3 to 9·5 grains.

"The minimum fatal dose of sulphate of atropia given alone was found to be twenty-one grains for a rabbit weighing three pounds. It is, therefore, remarkable that the $\frac{3}{200}$ths of a grain can prevent a dose of physostigma, equal to the minimum fatal, from causing death, and that the $\frac{1}{10}$th of a grain is capable of rendering non-fatal a dose of physostigma, equal to three and a half times the minimum fatal.

"Excepting dilatation of the pupils, these minute doses of atropia, and indeed any dose capable of antagonizing the lethal action of physostigma, are unable to produce any symptom recognisable by a mere inspection of the animal. Still, they undoubtedly produce energetic physiological effects—effects, however, which it is unnecessary to describe in this brief abstract. It is sufficient to point out that the notion, which exists in many quarters, that rabbits can scarcely be affected by atropia, is an erroneous one."

These interesting and remarkable experiments, while confirming previous theories as to the antagonistic action of poisons, show how loosely these theories have been constructed, and how much careful work is required before any practical advantage can be profitably taken of this most interesting phenomenon.

Part Fifth.

MEDICAL NEWS.

Meeting of the General Medical Council.—The fourteenth session of this Council was opened at two p.m., on Tuesday, 4th July, at 32 Soho Square—the President, Dr Paget, in the chair. Besides the President there were present Drs Bennett, Acland, Humphry, Embleton, Storrar, Alexander Wood, Andrew Wood, Fleming, Macrobin, Thomson, A. Smith, Leet, Apjohn, Sharpey, Parkes, Quain, Christison, Stokes, Gull, and Francis Hawkins (registrar), Mr Hargrave, and Sir Dominic Corrigan. Mr Cooper was prevented by indisposition from attending the first meeting. The President delivered his annual address, in which he complimented the retiring members, Dr Rumsey and Mr Cæsar Hawkins, on the able and conscientious services they had rendered to the Medical Council in the interest of the general public. He then expressed regret at the withdrawal of the Lord President's Medical Amendment Bill of last session, stating that though this Bill proposed to deprive both universities and medical corporations of their ancient privilege of granting licenses to practise, yet, after due consideration, it had been approved by the Medical Council by a majority of fifteen to three, and that this ought to be a sufficient answer to those who accused the Medical Council of caring more for the interests of medical corporations than for those of the public. He then expressed a hope that though the two Medical Bills introduced into Parliament this session by private members had to be withdrawn, they would yet have had a good effect in diffusing information in regard to the state of the medical profession among the general public, who were so profoundly ignorant of this matter which so intimately concerned themselves. He concluded by detailing the business about to be brought before the Council, and suggesting what he thought would be the best mode of conducting that business. Committees were then appointed on the following subjects:—Business, Finance, and the Registrations of Medical Students, and the Returns from the Bodies in Schedule (A) of Professional Examinations and their Results.

Then followed a discussion on the returns from the Medical Department of the Army, and the Military Department of the Indian Office, which it was complained were calculated to mislead, and had misled the public as to the number of the candidates who had failed to satisfy the examiners. This arose from all those who had merely failed to obtain commissions not being sufficiently distinguished from those who had failed altogether to satisfy the examiners—two very different things; yet this important distinction was not embodied in the statement, but merely noticed in a small type note. These returns were, therefore, unjust to other Examining Bodies, and so much the more so that they were often regarded by the public as a test of the value of the examinations of other Examining Bodies in the country; and though this idea was conclusively shown by Dr Alexander Wood to be erroneous, as he instanced a case in which a candidate rejected by the board which he represented had been, a few days afterwards, accepted by the Army and Navy Medical Board, when he had the cool assurance to write to the secretary of the Board, by whom he had been rejected, to say he now hoped there would be no objection to give him his diploma; yet the feeling of the Council being against the present form of these returns, Dr Alexander Wood's motion to refer them to a committee to report was agreed to.

Last session's Bill, The List of Examining Bodies, The Report of the Committee on Professional Examinations, The Removal of certain Names from the Register, Another Petition from Dr Pattison, and the subject of Colonial Certificates in connexion with a Petition for recognition from the Board of Public Examiners at the Cape of Good Hope, were then considered and disposed of. On the second day, Mr William Kempster was charged with having rendered himself liable to erasure from the Register, for having allowed a Mr Goodson, an unqualified practitioner, to practise under colour of his name, and for having signed certificates of the death of patients whom he had not personally seen. The defence was that Mr Goodson was Mr Kempster's assistant; it was accepted, and Mr Kempster was unanimously acquitted. In connexion with this case, Sir Dominic Corrigan moved that an amendment of the laws in regard to death registry was urgently required, which was unanimously agreed to. On the third day, Dr Parkes's resolutions in regard to the Report on Professional Education were considered, when it was agreed, that the instruction in pharmacy should be separated from that in therapeutics, and the former should be obtained at an early period, and the latter at a later period of the professional curriculum; that the professional instruction in midwifery should be extended, and that every candidate for a license should be required to attend not less than twenty labours; that it is desirable that systematic instruction in pathological anatomy should form part of the professional curriculum; that it is desirable that class examinations should form a necessary part of class instruction. On the fourth day, Dr Bennett made a statement as to a conjoint Examining Board for England, which was not discussed. A motion by Dr Fleming to make clinical instruction in medicine and surgery more practical than at present, and to limit the size of the classes, was negatived. A motion by Dr Storrar to give students the option of acquiring their knowledge of chemistry, and of passing their examination on that subject, before commencing their professional curriculum, was also negatived. Dr Parkes then moved that a letter should be addressed to all the licensing bodies, urging that arrangements for the formation of conjoint examining bodies should be undertaken without delay, and should be communicated to the President of this Council before the close of the present year. This was agreed to by all, except Sir Dominic Corrigan, who dissented. Dr Parkes then moved, that the universities and medical corporations established in each division of the United Kingdom should be requested to concert a scheme for the constitution and regulation of a conjoint examining board for that part of the kingdom to which they belong, and to transmit such scheme to the consideration of the General Medical Council; which was agreed to. Dr Andrew Wood then moved, that the report on medical education be recommitted and brought up next day in a form adapted to the resolutions of the Council; which was carried. On the fifth day, the name of Mr Frederick Henry Morris was directed to be removed from the Register. Certificates from the Board of Examiners in Literature and Science at the Cape of Good Hope, were agreed to be recognised. Drs Bennett, Acland, Sharpey, Quain, Andrew Wood, and Aquilla Smith were elected by ballot members of the executive committee. A motion by Dr Bennett, that it be referred to the executive committee to report on the most desirable mode of procedure in the case of motions having reference to penal procedures, was carried. A report from the Committee on the Returns from the Army and Indian Medical Boards, including draft letters to the secretaries of the several boards, proposing a new and better arrangement of the details of the examination, was agreed to, and the letters directed to be forwarded. The report of the Finance Committee, showing a balance in favour of the Council, was then received and agreed to. After which Dr Sharpey resigned his treasurership, and received the thanks of the Council for his long and valuable services; and Dr Bennett was appointed his successor. The report of the Pharmacopœia Committee was then received, and its members reappointed, their names being Drs Christison, Quain, Sharpey, and Aquilla Smith. On the motion of Dr Alexander Wood, a committee, consisting of Dr Alexander Wood (chairman), Dr Humphry, Dr Thomson, Mr Quain, Dr A. Smith, Dr Sharpey, and Dr Storrar, was appointed to report on the scheme of visitation of the preliminary and professional examination of the licensing boards. On the sixth day, the amended report of the Committee on Professional Education, embodying the resolutions agreed to, was read and accepted. In regard to the matter of conjoint examining boards, it was moved by Dr Bennett, that a meeting of the General Medical Council be held early in 1872, to receive the proposals of the bodies for conjoint examinations, and to consider whether any, and what, steps should be taken to carry out the resolutions of the Council in favour of such combinations; and this was carried. The report of the Committee on the Registration of Medical Students was then received, and postponed to the next meeting of Council. After some formal business, the thanks of the Council were then awarded to Dr Andrew Wood for his services as Chairman of the Business Committee of the Council during its present session, and to Dr Paget for his efficient services as Chairman of the Council during its present session. The proceedings then terminated.

FORFARSHIRE MEDICAL ASSOCIATION.—The thirteenth annual meeting of the Forfarshire Medical Association was held in the Town Council Room of Montrose on 13th ult., at twelve o'clock noon. Present—Dr Johnston, Kair House, President (in the chair); Drs Lawrence, Officer, Howden, and Watson, Montrose; Simpson, Marykirk; Ironside, Laurencekirk; M'Rae, Fettercairn; Mackie, sen., Brechin; A. Lawrence, Kirriemuir; Grant, Glamis; Crockatt, Pirie, Campbell, and Duncan, Dundee; D. Arrott and Dewar, Arbroath; Todd, Friockheim; and Professor Inglis, Aberdeen. Mr Annandale, Edinburgh, was present as guest.

The minutes of last annual meeting and subsequent meetings of Council were read and approved of; as were also the Treasurer's accounts.

The following gentlemen were then, on the motion of Dr D. Arrott, unanimously elected office-bearers for the ensuing year:—*President*, Dr Mackie, jun., Brechin; *Vice-Presidents*, J. Henderson, Esq., Auchinblae, Matthew Nimmo, Esq., Dundee; *Hon. Secretary*, Dr Duncan, Dundee; *Hon. Treasurer*, Dr Campbell, Dundee; *Council*, Drs Arrott, Lyell, Christie, Crockatt, Begg, and Pirie; *Local Secretaries*, as formerly.

It was remitted to the Council to watch the progress of any medical bill which might be introduced into Parliament next session, and to take such steps regarding it as might be considered necessary.

Dr Johnston then read a paper "On Amputation of the Penis, with Cases," which will appear in our next number; this was followed by a paper from Dr M'Rae "On Chloral." A good deal of interesting discussion on both papers followed, in which many of the members present took part. A wish was expressed that they should be published, and votes of thanks unanimously awarded to the authors.

Professor Inglis then gave the details of an interesting case which had recently occurred in his practice, illustrated by a specimen. He received the thanks of the meeting for having brought it forward. This concluded the business.

The members afterwards met to dinner in the Star Hotel at three P.M.,—there being present, in addition to those at the meeting, Professor Ogston, Aberdeen, as a guest; Drs Steele, H. Steele, and Key, Montrose; Mackie, jun., and Thomson, Brechin; Alexander, Forfar; and Arrott and Begg, Dundee. Dr Johnston, President, in the chair, being supported right and left by Professor Ogston, Aberdeen, and Mr Annandale, Edinburgh. Dr Lawrence, Montrose, one of the Vice-Presidents, acted as croupier; having right and left, Professor Inglis, Aberdeen, and Dr Arrott, Dundee.

ON THE USE OF CARBOLIC ACID TO PREVENT PITTING AFTER SMALLPOX.

To the Editor of the Edinburgh Medical Journal.

SIR,—Having experienced the beneficial effects of carbolic acid in preventing disfiguration of the face in severe cases of burning with gunpowder and with sulphuric acid, I suggested its employment, with this object, in a number of cases of smallpox admitted to the Dumfries Infirmary in March and April last.

It was applied in the following manner:—From the first appearance of the eruption, until the completion of desquamation, the face was kept constantly moist with the solution of the acid in olive-oil (1 to 8). The results, I am happy to say, have been most satisfactory. Drs Murray and Kerr, the physicians to the Infirmary, inform me, that of all the cases so treated (several of which were of the confluent type), not one has presented, on recovery, the slightest trace of disfiguration. The application, moreover, was most grateful to the patient's feelings, allaying the itching and irritation, and preventing the desire to scratch off the scabs, which is so annoying to the sufferers in the later stage of the disease.

In the case of gunpowder burning, the acid, in addition to its antiseptic and anæsthetic properties, appears to have the effect of suspending the carbon in solution, and withdrawing it from the skin. In a case which I treated about twelve months ago, on the method above described, the patient, a young gentleman, was so disfigured as to present the appearance of a negro, his face being blackened, his lips swollen and everted, eyelids closed, hair and beard much singed, intense intolerance of light, and profuse lachrymation, with great suffering. The application of the carbolic acid and oil was followed by instant relief, and the oil, becoming more fluid from the heat of the skin, ran over the chin with the appearance of thick ink. The result of this treatment was, that on recovery, which was rapid, there was not the slightest discoloration of the skin, and the face, in a very short time, presented its natural appearance.

Trusting that such of your readers as may have cases of smallpox under their care, may be induced by the above considerations to give this method of treatment a fair trial,—I am, Sir, yours, etc.,

W. Scott, M.D.,
17th July 1871. *Surgeon to the Dumfries Infirmary.*

Presentation.—Dr Johnston of Montrose has been presented, on his retirement from practice, with a very handsome silver dessert service by the numerous friends and patients whose love and esteem he had secured during the long period of thirty-five years, which he had spent in that town in the exercise of his profession. Dr Johnston was entertained at a banquet, on the occasion of the presentation, by a very large and influential assemblage of his fellow-citizens.

Obituary.—We regret to have to announce the death of Thomas Hawkes Tanner, M.D. St And., F.L.S., M.R.C.P., at the early age of forty-six. The author of one of the most concise and practical works of Practice of Medicine, which in every edition—and it has gone through six—was always abreast of the science of the day, few men have been more widely known, or more highly respected. He died at Brighton, on the 7th ult., of uræmic convulsions, the result of chronic albuminuria.

PUBLICATIONS RECEIVED.

Braithwaite's Retrospect of Medicine, Jan. to June. London, 1871.
J. H. Balfour Browne,—Medical Jurisprudence of Insanity. London, 1871.
Austin Flint, jun., M.D.,—Physiological Effects of Severe and Protracted Muscular Exercise. New York, 1871.
William A. Hammond, M.D.,—Treatise on Diseases of the Nervous System. New York, 1871.
Edward Henderson, M.D.,—Report on Prostitution in Shanghai. Shanghai, 1871.
Wharton P. Hood, M.D.,—On Bone-setting. London, 1871.
R. Whitfield Hewlett, M.D.,—The Baths of Bormio. St Moritz as a Health Resort. London, 1871.
Andrew Legat, M.D.,—History of the Smallpox Epidemic in South Shields, 1871. South Shields, 1871.
Morell Mackenzie, M.D.,—Essay on Growths in the Larynx. London, 1871.
W. D. Stone,—Half-Yearly Abstract of the Medical Sciences, Jan. to June. London, 1871.
Rapport sur l'Ambulance de l'Ambassade d'Autriche-Hongrie à Paris. Versailles, 1871.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Ovaritis.* By J. MATTHEWS DUNCAN, M.D.

THERE are some grounds for the rational expectation that the pathological history of the ovary will, in its course, follow that of its physiological history. For a very long time the womb was regarded as the chief and central organ in the healthy female genital system. It has been dethroned, and, in the meantime at least, the ovary holds the first place without dispute. The uterus is merely the nest, or organ of pregnancy. In pathological importance, I believe I am not wrong in saying that the uterus is still regarded as pre-eminent, and to this, its claims appear to me to be at least doubtful.

The delay of the professional recognition of the pathological importance of the ovary is easily accounted for. Its normal structure, even, is not yet generally known. Recent text-books of anatomy speak of its peritoneal coat; recent text-books of gynæcology speak of inflammation of its peritoneal coat; while there can be no doubt that it has no peritoneal coat at all. Not only are several such errors prevalent, but, further, the organ lies deeply, and has been generally, and is extensively, regarded as being beyond the reach of the ordinary means of physical diagnosis. These means are known to be available when it is enormously enlarged, as in ovarian dropsy or ovarian cancer. Few physicians know that the simple inflammation of the organ is within the scope of physical diagnosis, and fewer still practise this method. It requires for its successful adoption a careful education. So long as mere symptoms were trusted to in the vainly attempted diagnosis of ovarian inflammation, there could be no hope of differentiating it from other pelvic inflammations; and, consequently, the uterus, having in the professional mind established a prior claim, got all the credit or discredit of those ovarian inflammations, from which without physical diagnosis uterine inflammation was not distinguished, and was not satisfactorily distinguishable. Again, recent views, strongly held and widely disseminated, as to the pathological importance of the cervix uteri, arising from its liability to inflammation and ulceration, have given the uterus a renewed firmness of tenure of its exaggerated pathological pre-eminence, and the fortunate decadence of this once warmly fostered source of pre-eminence forms a favourable opportunity for asserting the claims of the ovary. Doing this in one limited pathological department, I carefully abstain from every appearance of wishing to establish for the inflammation of the ovary any such hypothetical and spuriously scientific paramount position as from various causes the corresponding disease of the neck of thewomb has in recent times obtained.

Ovaritis is a common disease, but I am sorry I cannot give any good idea of its frequency. This arises partly from the circumstance that, in the advanced stage of the disease, it is often impossible then to diagnose it, on account of its distinctive characters being obscured by adhesions or by perimetric (or more properly perioophoric) abscess. Besides this difficulty there is frequently another; namely, to decide, in cases where there is inflammation of both parts, whether the ovaritis or the metritis is the original and chief disease.

In a special small series of unselected cases that have come under my care, I find that while there are 23 cases of inflammation or ulceration of the neck of the womb, there are 12 cases of ovaritis; but this rough statement is not of much value. I have tried to make the comparison with a well-known common disease, for obvious reasons.

Ovaritis is frequently described as being of three kinds—1. Parenchymatous; 2. Follicular; 3. Peritoneal. This division has a strong resemblance to the analogous separation of pulmonic inflammations—1. Pneumonia; 2. Bronchitis; 3. Pleurisy; and perhaps I am not far wrong in supposing that a wish to equal in precision the pulmonary physician has been more truly the parent of this classification of ovarian inflammations into three kinds than any sound pathological basis. Certainly, speaking from a practical point of view, I cannot as yet see my way to any real distinction between the parenchymatous and the follicular disease. The peritoneal form is of course out of the question, yet perioophoritis, or inflammation of adjacent peritoneal membrane, is certainly common; but even this I cannot regard as meriting a distinct pathological place.

Ovaritis is divided into acute and chronic. The acute form is, as its name implies, rapid in its progress; and it may end simply by resolution; or its end may be complicated by perioophoric adhesions or abscess, or true ovarian abscess; or it may end in the chronic form of the disease. Chronic ovaritis justifies its special designation, by its tendency to run a tedious course, lasting as it often does for many years. It may go on for any length of time without the organ becoming fixed by adhesions, and without suppuration in its substance or in its immediate neighbourhood. It is this chronic character which renders this common disease one of the most important diseases of females.

One ovary only may be affected, or both. Sometimes, especially I think in the slighter cases, the disease affects and adheres to one ovary, but it is common to observe the disease to affect the right and left organs alternately, and this alternation may give a peculiar character to a case.

I have an impression, in accordance with common belief, that the left ovary is more frequently the seat of the disease than the right; but I am not sure of this. Among the cases already referred to, I find the left ovary named nine times, the right three times. Besides, however, I have frequently observed both ovaries affected.

The organ may be variously enlarged by inflammation; and several authors appear to me to have estimated the possible amount of enlargement at too small an amount. I have certainly observed it enlarged to many times its healthy bulk, and to at least three times its ordinary dimensions. In one of the most characteristic and perfectly-watched cases that I have seen, both ovaries were enlarged, globular or oval in shape, and well filled the posterior half of the brim of the pelvis, being in contact with one another at their internal surfaces: conditions implying an enlargement not less than that of a hen's egg; and, on post-mortem examination, I have seen this size closely approximated.

Ovaritis is a disease upon which morbid anatomy has thrown almost no light, and for the very simple reason, that it is rarely fatal. Morbid anatomists describe hypertrophy of stroma, congestion, abscess, inflammation of Graafian follicles, dropsy and abscess of the same, abscess of the stroma, cirrhotic atrophy of the whole gland, and, in cases of pyæmia, suppuration of the entire organ, and its change into a putrilaginous-like mass. Into this last condition I have no wish at present even to inquire, as it is only observed under the circumstances already referred to, and in regard to which I am not now discoursing. The other changes, including even abscess of the stroma, are not brought into contact with practice. The conditions which alone are at present cognisable by the practitioner are sensitiveness, tenderness, degrees of hardness, enlargement, and roughness of surface, and changes of position. Changes in these conditions, even when collated with changes in symptoms, cannot be made to indicate any change such as is recognised by morbid anatomy. Adhesions of and abscess around the ovary—perioophoric abscess—are often discovered by the morbid anatomist, and their occurrence is frequently diagnosed during life.

Ovaritis is frequently caused by the conditions of recent marriage; it may be produced by suppression of the menses from cold or other causes; it is often observed as a consequence of gonorrhœa; it occurs frequently during convalescence from abortion. That it is not frequently observed after delivery in advanced pregnancy is not good evidence that it does not often occur then, and I see no reason why it should not often occur then as it certainly does after abortion. Yet the fact remains, that it is less common after delivery at the full time than after abortion. It is observed frequently after operations on the uterus, such as metrotomy and other dilatation of the cervix; besides, it is frequently found in cases where no evident cause can be assigned for it.

When ovaritis occurs the patient suffers pain, and has the concomitant phenomena of what is called inflammatory fever in various degrees, just as in any other inflammatory affection. The pyrexia has no special characters, and the characters of the pain are extremely indefinite. It may be slight or severe; it may be acute or dull; it may be situated in the region of the ovary, or be referred to the groin or to the back, near, but not in the base of, the sacrum; it may extend down the thighs. I know no other symptom or characteristic peculiarity of pain worthy of mention. In short, our present knowledge of the symptoms of this affection does not carry us far. I find authors describing hysterical attacks, frequent calls to make water, constipation, painful defecation, difficulty in maintaining the erect position, pain following the extension of the lower limb on the affected side, pain accompanying decubitus on the healthy side, as symptoms of ovaritis; but I am certain that, while they certainly may occur, none of them deserves that distinction. A practitioner finding all these symptoms combined in a case would have no right on that account to diagnose ovaritis.

Suppression or diminution of the lochia or of the menstrual flow have been said by eminent authors to be produced by ovaritis. My own observations are not sufficiently numerous to enable me to say that such results do not occur; but I am certain that an opposite result is more frequently observed, and in this I believe I have the support of the majority of observers. Several recent authors describe menorrhagia as a consequence of ovaritis, implying by that term an excessive flow within a certain time; but numerous observations lead me to differ from this opinion, and to believe that in the menorrhagia, if it may be so called, of ovaritis, the flow is not excessive within any stated time, but is long-continued. Besides, bloody discharge from the uterus may take place at irregular times. These so-called disorders of menstruation appear to me to be among the most characteristic phenomena of ovaritis. There is reason to believe that chronic ovaritis sometimes terminates in cirrhotic contraction of the ovary; and this condition, if it affect both ovaries, will naturally be expected to destroy their function, and, therefore, to be accompanied by amenorrhœa. In a well-made young-looking woman, who ceased to menstruate at the age of thirty-three, while otherwise in good health, and who died of disease of the heart at the age of thirty-five, I found both ovaries contracted into hard fibrous masses, presenting a pale surface on a cross section, and in bulk not equal to the fourth part of a healthy ovary.

There is a form of leucorrhœa which I have observed to accompany an attack of ovarian congestion or inflammation. As I cannot speak of it in general terms, I shall describe a well-marked example of it: A lady had twice come to Edinburgh from a great distance to consult me. She had a large family, and was a weak, hysterical woman. Her chief complaint was of sudden attacks of illness, of which the principal characters were, pain in the region of the left ovary, and copious discharge from the vagina of a watery fluid, which soaked her linen, which when dry was stiffened as if by starch, and of a dirty colour. On both occasions, a careful physical examination discovered no disease, and the announcement of this fact to my patient caused her much disappointment, for she well knew that there was some serious weakening disease to whose attacks she was liable, and which caused her great alarm. She therefore resolved to pay a third visit to Edinburgh, and reside there until the lapse of time should show that she was cured, or bring another attack of the disease for my observation. After being here for many weeks alone, she was visited by her husband, and within a day or two from this time I was sent for to witness a return of the complaint. The leucorrhœa was copious, and just as had been described. I found the cervix uteri softened and patulous, and the left ovary could be distinctly felt, enlarged to the size of a walnut, and very tender, and its tenderness could be identified with the pain which the patient suffered in the region of the organ. The attack had a great effect upon the constitutional condition of the patient, but it disappeared in a few days.

It is generally alleged and believed that ovaritis is inconsistent with fertility. This, I am certain, is a mistake. I have repeatedly known pregnancy to occur not only when there was ovaritis, but when there was double ovaritis, that is, when both organs were affected, and both greatly enlarged. I insist particularly on this statement, having made my observations in cases presenting at the time every diagnostic advantage, and which were for many years subsequently, and still are, under observation. My limited experience would justify me in saying that abortion or miscarriage is specially liable to occur in cases of this kind. In one very severe and distinctly-marked case of double ovaritis, where miscarriage took place in the eighth month, the patient described her monthly periods as having occurred regularly during the whole period of the pregnancy. While, then, I assert that ovaritis does not necessarily produce sterility, I have at the same time no doubt that it frequently causes it. This is easily accounted for in other ways than by supposing the disease to produce derangement of the proper functions of the ovary. Ovarian adhesions may prevent the proper mutual adjustment of the Fallopian tube and ovary, at the time of rupture of the mature Graafian follicle: displacement of the ovary may have the same effect: besides, a woman suffering from ovaritis, acute or chronic, can rarely submit to sexual connexion, on account of the pain it inflicts.

it should no-uffering from chronic ovaritis often quickly assume Yet the fac-ward appearances of depraved health: the dull eye, the time tha-e, pallor, and anæmic look.

on the -itis is only to be made out or diagnosed exactly by a physical besi-mination. Manipulation of the hypogastric region generally b-scovers a feeling of fulness or tightness over the affected gland, but in many women fatness of the anterior abdominal wall may prevent the condition being felt. It is on a digital examination, per vaginam, that our chief reliance is to be placed. After ascertaining the position of the cervix and body of the uterus, the examining finger is pressed into the roof of the vagina behind and at either side of the uterine neck, and it may discover in the region of the affected ovary only the same fulness which has been described as being frequently felt on an external examination of the hypogastrium. If the ovary is prolapsed it is easily felt, as may often be done when it is in health; but, instead of having no tenderness, or swelling, or hardness, it is now, when inflamed, exquisitely tender, rounded, and more or less enlarged. Even when not prolapsed, the organ may, in a subject favourably disposed for this kind of examination, be found and manipulated by the common method of combined internal and external examination. If the organ is not adherent and fixed, its diseased condition may be made out with great precision.

Sometimes, especially if there are some adhesions, not parietal or pelvic, not fixing the organ, but merely connecting it with the uterus and restricting its mobility, it is difficult to diagnose the ovary from the fundus of a retroflected uterus. Danger of mistake arises from the circumstance, that a probe passed into the uterine cavity to aid in diagnosis, lifting up the uterus, lifts the ovary with it. The practitioner, finding the probe removes the tumour when it is pressed upwards, thinks the tumour must have been the fundus uteri. Such a mistake is, I am sure, often made. I can only prescribe for its avoidance the use of care, with a mind fully alive to the difficulty and the nature of the possible error.

If the organ be extensively adherent and fixed, then the conditions necessary for establishing precision are absent, and we have only a mass of tender hardness in one or other posterior quarter of the upper part of the pelvic cavity, or in both. In many cases such masses of hardness are known to be the consequence of ovaritis, from the history of the case revealing a progress from mobility of the inflamed ovary to fixation. If such a mass of tender hardness were felt on a first examination, its position might lead to a guess that it was perioophoritic, yet there would be no certainty that it was not produced by inflammation or other disease of the tube or of the uterus. This fixation of an ovary by adhesions I have observed to take place after the symptons were relieved; that is, pathological changes, immediately resulting from inflammation, were progressing while the symptoms of the original inflammation were diminishing, or were nearly gone. It is frequently said that parametritis, or more properly paraoophoritis or inflammation of connective tissue in the neighbourhood of the ovary, occurs as a consequence of ovaritis—a statement which I cannot positively attest by any observations of my own. Only, I ought to add, that I have notes of a fatal case, apparently from abscess found post mortem between the folds of a broad ligament, in which ovaritis was diagnosed.

When suppuration occurs in the ovary, or around it, it may be easily made out by the attendant phenomena, if they are well marked. They are, increase of pain, which sometimes has a throbbing character, once or twice daily attacks of fever, followed by perspirations, which are generally profuse. The feeling of fulness is supplanted by hardness, which has more or less of a renitent character. Sometimes, again, the hardness is in its central parts supplanted by the feeling of fluid contents. But it often happens that these phenomena, which collectively denote the occurrence of suppuration, are absent or very ill marked, and the practitioner is left in doubt, even when he is both experienced and skilful.

The prognosis in cases of simple ovaritis should always be very guarded. For, although many cases mend rapidly, many are very tedious. The occurrence of pregnancy is to be looked upon as favourable, especially in the ovaritis of the newly married; but it forms no sufficient ground for the prognostication of early recovery.

I have already said enough to show that, in this disease, the practitioner must use all his therapeutical skill to stop or to modify its progress. It is not to be wondered at that he is often baffled. For, besides the usual difficulties attendant upon treating a disease which is apt to become chronic, or is already so, he has special difficulties to encounter. The invaluable condition of rest of the affected organ cannot be maintained; the ovarian congestion attendant upon the maturation and bursting of a Graafian follicle comes to undo all that treatment may have effected. If pregnancy occur, the monthly ovarian congestion is probably altogether suspended, but only to be supplanted by a more permanent, if less active, hyperæmia. Sexual excitement—and I am conversant only with cases of ovaritis in which there had been previous cohabitation—is liable to reproduce or increase inflammatory congestion. In the case of the married, many circumstances not of a purely medical character may combine to render the physician unwilling to advise complete abstinence from sexual excitement: besides, it is, at least in many cases, highly probable that total abstinence from sexual pleasure would not have the desired effect, leading, as it would, to the irritation consequent upon unsatisfied desire.

I know nothing that is peculiar or specific in the treatment of acute or chronic ovaritis. The same general principles and method that are applicable to other inflammations must be adopted in this. A wise and experienced practitioner, studying the constitutional and other peculiarities of his patient, will have more success than the inexperienced; and there is very little more to be said, considering that I wish to avoid entering upon the wide subject of antiphlogistic treatment in acute and chronic disease. A few details may, however, be given in conclusion.

In chronic cases, two, three, or four leeches may be applied through a glass speculum to the cervix uteri, and the bleeding from the leech-bites encouraged, if need be, by hot fomentation of the vulva. The leeches may be repeatedly applied after successive monthly periods. In some cases it may be preferred to apply a larger number of leeches over the inguinal canal.

As in other chronic inflammations, counter-irritation is here often useful. It is best effected by applying the irritant over the inguinal canal adjacent to the affected gland. A small extent of counter-irritation, say about two inches square, is sufficient. It may be produced by a croton-oil liniment or antimonial ointment, or by keeping a blistered surface from healing. Instead of these forms of counter-irritation, a seton may be used.

The regulation of the bowels is important. For this purpose the gentle salines are best adapted. Some patients derive advantage from the use of mineral waters, such as those of Kreuznach; others receive benefit from the waters of Homburg or of Kissingen.

Iodine, bromine, and mercury may be used with all the care that is exercised in the administration of these remedies in other chronic inflammations.

The arrestment of leucorrhœa, especially by speculum and caustic, I do not think is desirable, at least in an early part of the course of a case. Indeed I have little doubt that the kind of treatment referred to is occasionally a cause of ovaritis.

The disease is universally regarded as difficult to treat successfully, and is liable to recur; and when it rapidly disappears under treatment, the practitioner, while rejoicing with his patient, must take care not to assume, without good reason, that his therapeutical proceedings have been the cause of the good result.

The treatment of ovaritis ending in abscess, whether in its substance or in the peritoneum around it, I do not consider at present. It forms part of the wide subject of perimetric abscess. I shall only remark, that several cases which I have met with lead me to believe that abscess of the substance of the ovary is much more dangerous than perioophoritic abscess.

ARTICLE II.—*Notes on Cases of Yellow Fever in St Kitts, W.I., during* 1868, '69, '70. By W. MUNRO, M.D., C.M., Medical Officer, District No. 1.

THE following paper, which is a kind of report of a number of cases which occurred in this usually exceedingly healthy island, in 1868, '69, '70, of yellow fever, is, I may premise, in many respects, necessarily imperfect, as all reports of cases occurring in private practice are apt to be. Some of the cases were under my own observation, but the greater number have been reported to me by my colleagues, all of whom I take the opportunity of most cordially thanking for their kind assistance. I have, in this report, in a great measure, avoided the question of treatment, which my limited experience does not allow of my freely discussing; but I dwell as forcibly as possible on all points bearing on the etiology of the disease. All the evidence I have been able to collect appears to me to point strongly to the correctness of the "infection theory," although I am by no means inclined to reject the idea that it can *also* originate *de novo;* indeed, I believe that the first case was most probably one so arising, the atmospheric and bad hygienic condition surrounding it acting as causes.

Annexed is a table (pp. 215–218) of, as far as I know, all the cases that occurred; before going into the consideration of which, however, I propose stating succinctly the views which, chiefly from what I have observed while collecting materials for this paper, I hold in regard to the infection of yellow fever. In the first place, as I have already stated, I consider that it may arise *de novo*, as it probably did in the first case in the table, of which more presently; but when once it *has* so arisen, such a first case becomes a centre of infection, not only for those in the house and attending to the sick, but for the air surrounding that house to an indefinite distance. This infectiousness of the air *might* pass away without doing any harm, but if any one, while it lasts, expose himself to any of the common causes of common fever (seasoning or colony fever), this poison now floating in the atmosphere, derived from the first case as a centre of infection, will attack him, and yellow fever will, so to speak, be superadded to, or in appearance take the place of, the ordinary fever. Of course those in immediate contact with the sick stand a greater chance of infection than others.

If the first or any other *infected* case remove to a distance from the locality of the original "centre of infection," he forms a new centre of infection, infecting the air, as in the case arising *de novo*, to an indefinite distance around him, and the house he lives in. I consider the dying stage, after black vomit has fairly set in, as the most dangerous to those liable to be infected, and also that there are emanations of yellow-fever poison from the corpse.

Of course, as is well known, the state of the weather must be favourable to the infection of the atmosphere from the first centre of infection; there must be little wind and great heat, otherwise the poison will be blown away whenever thrown off the body, and the case will be put down as a "sporadic one," one of which is seen in each of these islands, even the most healthy, every two or three years.

As to the age of the attacked. Very young children may be, but infants are not, old people seem also not to be, susceptible.

Europeans, and especially those just come out, seemed to be the most susceptible; then the Portuguese, nearly all of whom are natives of Madeira. Next to those came the natives of Barbadoes, who, I am informed by Dr Branch, a native of that island, are nearly as liable to the common colony fevers of the other West India islands, when they live in them, as English people. This appears to be because, Barbadoes being the most windward of the windward (or eastward) islands, and being flat instead of mountainous as the others mostly are, the breeze from the Atlantic blows constantly over the whole of it freely, so that it is comparatively cooler than the other islands, at least the leeward side of them—that is, the side protected from the Atlantic sea-breezes by the mountains in the centre of the island, as in St Kitts, where the windward temperature is usually four degrees Fahrenheit lower than the leeward, as I have myself observed here. The natives of the island of course, being accustomed to the heat, are not liable to fever; but Barbadians, having always been accustomed to what may be termed a windward temperature, are so. Thus, only two native white Kittifonians died of the fever (cases 56 and 108), and one of these was a boy, a "poor white" child, living in great poverty. Now, I do not consider a a boy of 14 years to be in the condition of a properly acclimatized native; he has not lived long enough to be so; for it seems to me not to be the case that West Indians are born acclimatized (*i.e.*, not liable to fever), but that, by having frequent slight attacks of fever during childhood and adolescence, they become so. A greater number of Barbadians, both absolutely and relatively, as compared with the number of the white natives and coloured natives, died of or had the fever. A number of Portuguese Creoles (those born in St Kitts of Portuguese parents) had it, but their conditions of life are different from those of the whites; they and everything about them being so filthy, that the wonder rather is that more did not die than that some did. I have not the least doubt, I may say here in passing, that had there been no Portuguese on the island the fever would have passed away in three months, as in former outbreaks, instead of lingering sixteen as it did. This may be worth the consideration of West Indian legislatures, who, in time to come, may have under consideration the question of importing Portuguese.

I subjoin a table (No. I.), showing the cases according to nationality; the Creole Barbadian being, for reasons obvious enough from what has been stated above, set apart from the Creoles of St Kitts, whether white or coloured.

TABLE I.

Nationality.	Total.	Recovered.	Died.	Per cent. of deaths to total.
Europeans and Americans, .	15	8	7	46·6
Portuguese, ...	67	38	29	43·3
White Creoles of Barbadoes, .	7	3	4	57·14
White Creoles of St Kitts, . .	7	5	2	28·5
Coloured Creoles of Barbadoes, .	6	6	0	
Coloured Creoles of St Kitts, .	3	2	1	33·3
White Native of Demerara, .	1	1	0	
Black and Coolie, . . .	2	1	1	50·
Totals, . . .	108	64	44	40·7

From the table given above it is quite clear, so far as such a small number of cases can show, that the natives of temperate climates had both a much greater tendency to the disease than those of sub-tropical and tropical climates, and also that the disease is more fatal among them. In looking at the table, it must be remembered that there were not more than fifty Europeans and Americans in the island when the first case occurred, while there were hundreds of Portuguese. The greater tendency to the disease among the Europeans also showed itself in the fact, that, except the very first, all the cases in the beginning were Europeans, *new-comers*, and they were all fatal. The disease in some way seemed to gain greater strength as it remained longer in the island. From newly-come Europeans it spread to *adult* Portuguese (it is to be remarked that it began in a *child*, who, according to the views already stated, I do not consider to have been thoroughly acclimatized); then gaining further strength, it attacked Barbadians (cases 14 and 15); and laterly natives of St Kitts, both white and coloured, and in one case black; as also Europeans who had been many years in the island, and were thoroughly acclimatized. Throughout, the Portuguese served as a kind of pabulum, on which it was fed between the cases occurring among Europeans, natives, etc.

It may be that the atmosphere, becoming in course of time more and more thoroughly impregnated by the fever poison, is the cause of this increased power of attacking natives, coloured people, etc., who at first seem to enjoy complete immunity from it. This idea would appear to be strengthened by the fact that some of the cases occurring last were exceedingly virulent. Mr Grimes (case 93) died in three days; Antoine Farnance (101) in the same; Mr Guy (102) in five days. This last case was a very malignant one. Case 108 does not vitiate this, as it occurred in a poor white boy, who died more from want of food and exhaustion than from the fever itself; the poor whites here living in the most extreme poverty.

I append two tables (III. and IV.), the first showing the temperature and state of the wind from January 1867 to December 1869. It will thus be seen that while the first five months of 1868 were rather cooler than usual, the next six, including September, in which the fever arose, were above the average. To strengthen the point, I may mention that the means for the months from September to December 1866, were as follows:—

Sept.	Oct.	Nov.	Dec.
84·16,	82·35,	83·72,	80·53;

all of which, as may be seen on reference to Table III., are lower than the means in 1868, and, to a certain extent, than those of 1869. It is to be remarked, indeed, that the temperature of September 1869 was much above the average; while again, in that month in 1869, after it was thought the fever had left the island, it broke out anew.

It will be seen by the table, that during the whole of August 1868, except in one day, the wind was either light or moderate, and that this continued all through September, October, and November. To show how calm it was sometimes, I may mention that, having to go to Antigua on the 17th November in a sailing vessel, I passed three days and two nights in going a journey of only sixty-five miles, and this simply from want of wind.

I may here state, that the means given above were calculated from records of daily temperature kept by G. Evelyn, Esq., comptroller of revenue, which he most kindly lent me for the purpose. Being taken at the Customhouse on the sea-shore, they show a temperature on the whole about two degrees lower than that of the town itself; but this in no way detracts from their value for comparing the temperature of one year or month with another. Those of 1867 were taken at 9 A.M., noon, and 4 P.M.; those of 1868, at 10 A.M. and 2 P.M.

In regard to the rainfall, I would draw particular notice to the fact that September 1868 was the *rainiest* month of the four years, the rainfalls of which are given in the table, while the great bulk of the amount that did fall fell up to the 15th. Now, as seen in Table II., the first case *died* on the 21st, after about five days' illness. The child must, therefore, have taken sick either *on the day after the greatest rainfall of the year, or on the very day of that rainfall.* There is some marshy land to the eastward (windward) of the town, but I hardly think any miasmata from it could have caused or set up this child's fever, as it had no time to dry after the heavy rain, the child being taken sick, as already stated, at, or nearly at, the time of that rain. I am the more inclined to think that marsh miasm had nothing to do with the production of the fever, that in none of the cases which either came under my own notice or have been described to me, was there the least intermittance; they were all cases of continued fever, although different forms of it were presented. Besides this, in all cases in which I had a chance of examining the urine, I found distinct albuminuria, showing that the poison acting on the blood was specific, and not miasmatic or malarious.

The atmospheric conditions of the time at which the fever first showed itself may then be briefly summed up thus: Great and continued high temperature, little or no wind, extraordinary rainfall, and low barometric pressure. (See Table III.)

In accordance with Dr Parke's views, that yellow fever is a "fæcal disease" (see "Practical Hygiene," second ed., p. 446), a very probable fæcal cause might be traced as having something at least to do with the fever.

The greater part of the town of Basseterre was destroyed by fire on the night of the 3d July 1867,—a calamity which, among other misfortunes, by burning down the privies, left their pits open, with the exception of such ashes as fell into them. The old pit system is as yet the only kind here, although, after the introduction of water from a distance of five miles up the mountain (a work at present in progress, and which, it is hoped, will be finished by the end of 1871), it is to be sincerely desired that a better system of disposing of human excreta will be inaugurated.

These pits lay in this state until after the fever had begun, but have since been filled up or covered over.

It may, of course, be objected to this: Why did not the yellow fever break out sooner than September 1868—fifteen months after the fire? The answer to this lies, of course, in the absence of such atmospheric conditions as were necessary for the production of the fever, and which seem to have occurred for the first time for the fifteen months in the first half of September 1868.

I am not aware of any specially filthy state of the first house in its vicinity, but can only speak of the state of the town in general. The Portuguese, as a people, are, however, very dirty in their habits.

The considerations stated above all lead, as I will soon again have occasion to notice, to the idea that the first case *arose de novo*, although, on the other hand, it is not quite impossible that the child might, in his passage from Grenada, have come in contact with yellow-fever poison; this, however, as he came, so far as I could ascertain, direct, and in a sailing vessel, was very unlikely, to say the least. It will also be noted farther on, that similar "fæcal" conditions were present at Wingfield, where Mr Joseph Evelyn (case 70) was taken ill, with similar atmospheric conditions.

We may now proceed to consider the cases noted in Table No. II., tracing, where it seems to be possible, the connexion between different cases in the way of infection. In many cases it has been impossible for me to do so, especially among the Portuguese, many of those that died having no friends in the island—even when, after their deaths, I could obtain any information whatever as to their movements before they were taken sick, so as to trace where or how they got the fever.

Of case No. 1 I have but little more to add to what has already been stated. The child had come from Grenada about two weeks before it was taken sick, in good health. There was no yellow fever in Grenada at the time, as I have been assured by Dr P. M'Leod of that island, who most courteously and satisfactorily answered my inquiries on the subject. When first taken sick, he was supposed to have got a bad cold, and Dr Boon was not called in until the third or fourth day (the 19th). A day or two before he died he was removed to a house to the eastward of the one in which he was taken sick, and in which his father, Antoine Pistana (case 9) died afterwards.

Thus, this case seems to have been one of yellow fever arising *de novo*. He certainly did not bring the disease with him from *Grenada*, and as certainly his was the first case in this island for many years. The question may be mooted, was it a case of yellow fever from the first, or a case of common fever, predisposing to the attack of the yellow-fever poison, which had possibly been generated by the state of the atmosphere and other causes already noticed. I am, on the whole, inclined to the second opinion—a careful noting of facts connected with other cases having led me to believe that this is common—an ordinary fever predisposing to the reception of the yellow-fever poison. The question is very undecided, however. That it was a case of yellow fever, there cannot be the slightest doubt. He was attended by my much-respected friend, Dr Boon, who, having practised in St Kitts for more than thirty years, and seen in that time many cases of yellow fever, is too well acquainted with the disease to make any mistake in diagnosis, as a medical man only two or three years out from England, who had never before seen a case, might be very apt to do.

Whether marsh miasmata had anything to do with this case must remain, to a certain extent, an open question, although I think they had not, except in so far as they might predispose by their depressing influence. I am aware that others *might* differ from me in opinion. Having said all I know in regard to the case, and the time at which, and conditions under which, it occurred, I have done all in my power to put my readers in as good a position to judge as is possible.

Case No. 2.—Mr Horne lived in a house about fifty yards from the last, to the north, *right in the direction* of what little wind then prevailed (see Table III., September 1869). Thus the child Pistana's case may have been a "centre of infection" from which Mr Horne received the poison some time before he was actually taken ill.

The night before he was taken sick, Mr Horne swallowed a hasty dinner, and then gallopped to a place about one and a half miles from town, and plunged into a bath while still heated. For the first day or two he appeared only to be suffering from ordinary fever brought on by his own carelessness; but at length yellow fever with black vomit set in and killed him on the fifth day. Now, it is just possible that he only had ordinary fever at first in reality, but that the yellow-fever poison still hanging about in the atmosphere, unable to attack him when in good health, seized on him when predisposed to its attack by the ordinary fever. It is at least very probable (and this applies to several other cases) that, had he not exposed himself as he did to the causes of ordinary fever, yellow fever would not have attacked him.

CASE 3.—Was at Mr Horne's funeral, and acted as a bearer (a very improper thing, I would observe, to allow Europeans to do in such cases). The day before he was attacked he was working hard at a forge at Bayfords, then walked home a distance of three miles in the cold damp of the evening (Bayfords being the coldest place in St Kitts), in a thin linen jacket. On the fifth day, when I saw him, the case appeared one of ordinary fever; yellowness of the eyes had only just begun to show itself, but the skin was very hot. It was not till the sixth day that it showed itself as decidedly a case of yellow fever, and he died on the seventh day. This case, therefore, would also support the idea that yellow fever is sometimes simply superadded to common fever. Having been exposed to the infection from Mr Horne, he might have escaped, but by acting imprudently brought common fever on him, which rendered him powerless to resist the action of the specific poison, which of itself would depress the nervous system. I would beg my readers distinctly to understand, however, that I merely put forward this idea for what it is worth, and not for one of which I consider there is any certain proof of the correctness.

CASE 4.—Mr Gillie was also at Mr Horne's funeral. He was much frightened at the death of Mr Johnson, and took to bed on seeing his funeral pass on the 10th, never to rise from it. He had very severe black vomit and bleeding from the nose, mouth, and conjunctivæ.

The fever seemed to be now fairly established, the air of Basseterre being impregnated with the poison, so far as can be judged from the continuance of the cases.

CASES 5, 6, and 7.—I have not been able to trace any connexion between these and any other cases; they probably got infected through the atmosphere.

CASE 8.—Master W. Laing. Not being acclimatized, as I have already said, I consider he was the first West Indian Creole who suffered. Although residing five miles from town, he came in every day to school, and thus got within the sphere of infection.

CASE 10.—M. Le Blanc. This was a very severe case. He recovered, but never got back his health, his stomach having been entirely ruined, so to speak. He never, up to his death, which happened eighteen months afterwards, was able to eat food enough to support him, but was compelled to really live on spirits. From what I observed in him, as also in other cases, in some of which I gave carbolic acid myself, in the belief that I was doing my best for my patients, as also from noticing that in cases in which it was not given no such after-consequences were produced, and even in cases in which it was given from the very first under my own directions (as in case 101) it produced no good effects whatever, I have become convinced that even if of any use—which I decidedly question—the mischief caused by it to the stomach, and even to the system generally, put a veto on its being used, and have caused me utterly to renounce its use internally in my own practice. Professor Lister has found the proper place for it, and there, so far as lies in my power, I will keep it in future.

CASE 11.—Mr Lozack has never entirely recovered his health since his attack. Carbolic acid was given to him.

CASE 13.—This was the first case out of town strictly speaking, as, unlike Willie Laing, Mrs Slack does not often come to town. Mardenbrough is about 700 feet above the sea, and nearly two miles from town, and is very isolated. Case 21 seems to have been infected from this, although in some way the poison lay dormant for nearly three weeks.

CASES 14 and 15.—Mrs Jordan was Dr Branch's servant, and was in the habit of looking after his clothes while he was in attendance on the cases of yellow fever. He saw the most of the cases up to this time. Mrs Branch, his wife, probably got it in the same way as Mrs Jordan.

CASE 17.—Mary Gumbs. This woman was the first case at any distance from town. Philip's being nine miles from Basseterre, I have been unable to get anything very definite from her; but from what I could gather, she seems to have been in town about a week before her attack. Be that as it may, her husband was in town very often, and may have carried the infection to her. She became a new centre of infection for the district in which she lived. The cases traceable to infection from this one are the following:—Nos. 18 and 22; and in the "doubtful cases," Suphrine Gumbs, and his wife and children.

CASE 18.—Spent a week in her house while she was convalescing, and when returning home to West Farm, on the last Sunday of 1868, stopped for a short time at Suphrine Gumbs's house to see him. When leaving the house he was struck down with fever, and died with black vomit on the following Sunday. Soon after, Suphrine Gumbs, and then his wife and children, were seized with all the symptoms of yellow fever, only their skins did not become yellow, and they had no black vomit. Dr Dinzey, who saw them, considered that they were cases of masked yellow fever. The husband and wife being old residents in St Kitts, and the children Creoles, may account for their escaping so easily, while their country people, more lately come, suffered worse.

CASE 22.—Joseph Sainte kept S. Gumbs's shop while he was sick, and just as he recovered was seized with the fever. This was a very virulent case. He was quite well on Monday the 24th January; was taken sick on Tuesday morning; and before I saw him at three P.M. on Wednesday, had had black vomit, and was in a state of collapse, with supression of urine, and muttering delirium. He died at two A.M. on Thursday.

CASE 19.—The only one in a coolie. Seen by Dr Branch. Canada is about 1200 feet above the sea.

CASE 23.—Mr Marshall's was a very severe case; only saved by stimulants, which were given him by the bottle, "coup sur coup." He has never entirely recovered his health, although now much stronger than he was for the first six months or so after his illness.

I have little to say of the next cases, except that cases 25, 28, and 29, were in a father and his two children; and cases 26 and 27 in a brother and sister, pointing to infection.

The fever now left town for some time, and, indeed, with the case of Jose Bresan, ceased entirely in the island for a month; when, on 8th April, it broke out with great severity, for the first time taking a kind of epidemic character, although on a small scale, in Sandy Point, ten miles from town. In these cases, I am informed by Dr Semper, the tendency to bleeding was very great, and the pulse was very little accelerated.

I know little of these cases individually, but would beg to draw attention to the tendency, so to speak, of the disease to pass further and further from the town, beginning at Sandy Point and passing more and more round the island with the wind. Case 52 is no exception to this, for he went to Big Sir Gillis's to see some of his friends sick of the fever. In some cases the poison would appear to lie dormant for a long time, but in this it acted very quickly. He went to Big Sir Gillis's on Saturday, and slept there, but was advised to return to the Hope Estate on Sunday, which he did. He did not appear very well when he got home, and on Monday was very sick. On Tuesday he was a little better and able to go out, but on Wednesday the fever fairly seized him. I did not see him until Friday (the labourers here, both black and Portuguese, being very dilatory in calling medical assistance). I noticed the same slowness of the pulse as Dr Semper in his cases, from which this one took its origin. He complained of fearful pains in the limbs and over the body. On Sunday the urine was intensely albuminurious, but the conjunctivæ continued clear. Refusing all treatment, he died on Monday, 17th May. Hope Estate is about 1000 feet above the sea, and much isolated, so that the disease had little chance of spreading further.

In June, as is seen by the table, the cases were few in number, and in July there were none at all—nearly seven weeks elapsing at this time, during which the island was free from the fever. In August only two cases occurred, just enough to take away our hopes that it had quite left us; but at the very beginning of September it broke out again, and continued through October, November, December, and part of January 1870; this time attacking, indiscriminately, not only newly-come Europeans and Portuguese, but old residents, and Barbadians, both white and coloured, and even Creoles of St Kitts, although not fatal among the latter, except in three cases, only one of these being an adult. Now, in looking at the tables of temperature, etc., I have given, it will be seen that while August was an unusually hot month, September was also both unusually hot, and the rainfall was the heaviest of the year. October also had a very heavy rainfall, with heat little diminished, and low barometric pressure. Thus, while the heat of August may have prepared the way, the heat and moisture of September may possibly again have roused up the dormant energy of the poison brought into action in the same month of the year 1868.

The question may be very reasonably asked, If such heat is necessary to the generation of the poison, how did the fever continue through November and December, the latter of which was rather colder than usual? To this, an answer will be given in my consideration of these latter cases, in which it will be seen that almost all of those of which I have been able to get any correct history, were connected either directly or indirectly with cases occurring earlier. Once infected, they would, of course, carry on the disease as long as there was pabulum for it to feed on, or until the atmospheric conditions occurred, of whatever nature these may be, in which infection is no longer possible.

I know little of cases 60 to 64, so will pass to that of John de Crosse (65). This one is of some interest, as it appears to have been a centre of infection for some others, directly or indirectly. The following cases might be so traced to it, so far as I could ascertain:—viz., 66 (67 and 68), 71, 72, 93, and the last "doubtful" case. It is not improbable, had it been possible to ascertain the intimate history of all the parties concerned, that some connexion *might* have been also traced between these cases and those of Miss Tony and Mr Joseph Evelyn, and so, through Mr Evelyn, with all the cases traceable to his; but all, or most of them, being dead, this is impossible, even if it were practicable in other respects. Francis John (66) visited John de Crosse while sick, and appears, from all I could learn, to have been infected by him, although, the case being more rapid, he died the same day. Francis John's two children (67 and 68) took it from him.

CASE 71.—Mr Pamento, manager of Lynch's, was very much alarmed about the fever. Fear indeed, by depressing the system, seems in his case, as in Mr Gillie's, to have predisposed to infection. His house was only about ten yards from John de Crosse's, and to leeward of it.

Maria Baptiste (72) was at John de Crosse's funeral, and probably visited him while sick. She thus carried it further round the island than it was before.

Mr Grimes (case 93) was the father-in-law of Mr Pamento.

Being a thirty years' resident, he might almost be considered a Creole. He did not seem to have caught the infection directly from Mr Pamento, as it is hardly probable, though quite possible, that the poison could have lain dormant from 13th October to 3d December; but he visited Lynch's house only a few days before he was seized, and may there have inhaled the poison from the still infected atmosphere. Besides this, his daughter removed to his house only a short time before his seizure, and brought some of her late husband's clothes with her. As there were no other cases near town at this time (Taylor's is only a quarter of a mile from town), it is almost certain that Mr Grimes got the infection from Lynch's in either one or other of the ways indicated above. For believing that clothes may carry the infection of yellow fever we have good reason, from the analogy of scarlet fever, its poison being, as is now well established, so communicable, as for instance is shown in a paper by Dr Hislop, in the *Lancet* of 26th November 1870. Mr Grimes might have escaped, but caught cold by exposure the day before he was seized, and so rendered himself more liable to attack.

Miss Tony (case 69). I have been unable to learn more of her case than is stated in the table.

Mr Joseph Evelyn (case 70). This is a very interesting case, having been directly or indirectly a centre of infection for many of the succeeding cases:—viz., so far as I could trace, cases 75, 76, 77, 78, 79, 81, 86, 87, 88, 89, 92, 96, 97, 98, 100, 101, and 102.

It is also interesting, as having apparently been produced by a combination of conditions now considered likely to act as predisposing causes, the exciting cause being exposure.

Wingfield House is "delightfully situated," so far as hygienic conditions are concerned, there being a cattle-pen on the one side, and a mule-pen on the other, the delicate aroma of the droppings from the inhabitants of which finds its way into the house with every wind that blows.

Living under such conditions, Mr Evelyn unfortunately got exposed at night, very lightly clad, while putting out a fire which occurred in the yard a night or two before he was taken ill, and very incautiously, so clad, sat all night watching in case it should occur again, it being believed to be the work of incendiaries. He caught what was simply supposed to be a severe cold, but which rapidly passed into yellow fever, of which he died.

Case 75.—His brother, Mr Edward Evelyn, having been in attendance on him, was seized when going home to Matthew's, but being put in a *warm bath* immediately, producing *profuse perspiration*, recovered. As there were no other cases near Matthew's (which is twelve miles from Wingfield) it is improbable that he got it there, while it is in every way probable that he got it from his brother.

Case 81.—Mr W. Evelyn, another brother, seized in the same way, after close attendance on Mr Joseph. Heldon's is about eight miles west of Wingfield. His children and nephew, no doubt, got it from him.

Soon (about three weeks) after Mr W. Evelyn's death, his widow and family shifted to Matthew's, and it may be an open question whether they or Mr Edward carried the infection there, or if they only strengthened and increased in amount the poison already carried by him, as, soon after their arrival, a number of the Portuguese on the estate, and living in the vicinity of the house, were taken ill, one after another—cases 76 to 79, 86, 92, 100, 101.

After their removal, two other children and Mrs W. Evelyn were taken ill, then Mrs Howe, living at Greenhill (about 1200 feet above the sea), a servant in Matthew's, case 100, and Mr Guy, who, although living at White's, was at Matthew's every day, a great part of the time. The people in Matthew's are in constant communication with those at White's.

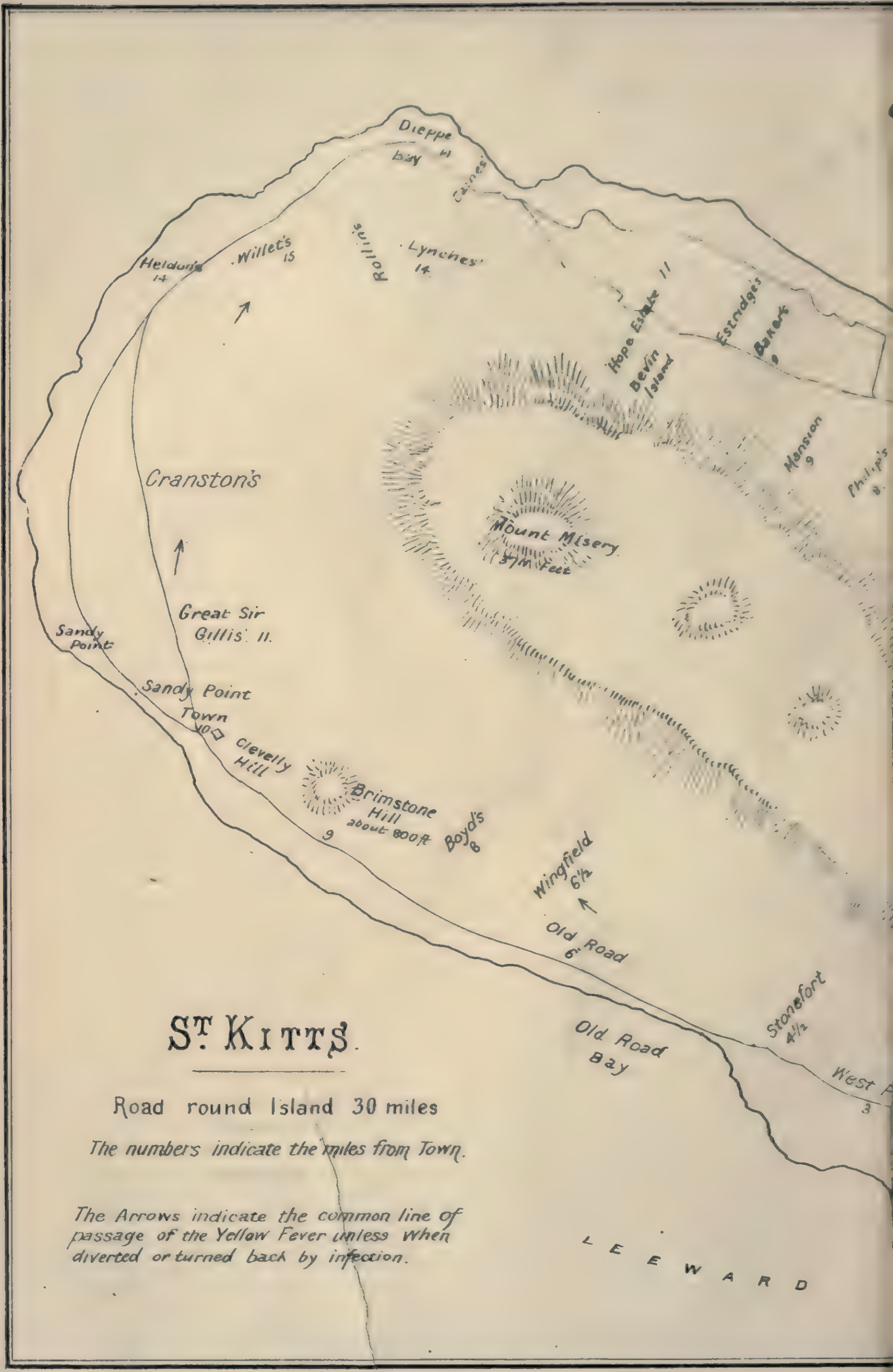
It thus appears to me that on no other theory than that of infection can we account for the disease spreading in two different directions from the house of Mr Joseph Evelyn, jumping over many miles in each direction, and appearing in and about the houses of his *two brothers*, no other cases occurring round those houses for a radius of some (in the case of Matthew's, many) miles, except those very reasonably traceable to infection from cases in the house.

Of the cases of the Parson's, Rollin's, etc., I know no more than what is stated in the table; but in the remarks it will be seen that several in attendance on the sick, or visiting them after, contracted the disease.

Esperina Farnance (case 103) I saw on the fourth day of her illness. She was then past hope; she had black vomit, and the urine was highly albuminous. I could not trace out where she had been infected, if the disease in her case was so caused; but there appeared to be some connexion between her case and that of Francis Smith, who was at school only about forty yards from the house in which she died, the house being just beside the space in which the scholars played. He was, I believe, the only white pupil in the school.

Of the doubtful cases, Suphrine Gumbs, with his family, had a very severe fever, which, although they had no yellowness of the skin or black vomit, as already stated, Dr Dinzey, who attended them, had do doubt, from surrounding circumstances, was masked yellow fever. As these cases occurred early in the outbreak, before the poison had acquired the power of killing natives and long residents, and Suphrine and his wife were long residents, the fever going no further than it did, may perhaps be so far explained.

In my own case, I had heat of skin, with some pain in the back, and headache, for one day. Although the weather was very cool—highest 77½°, lowest 73° Fah.—and I was undergoing no kind of exertion, and the house I then lived in (Baker's) was exposed very much to the cold north winds, and the day showery, I sweated so much that I had to change my underclothing five times during the

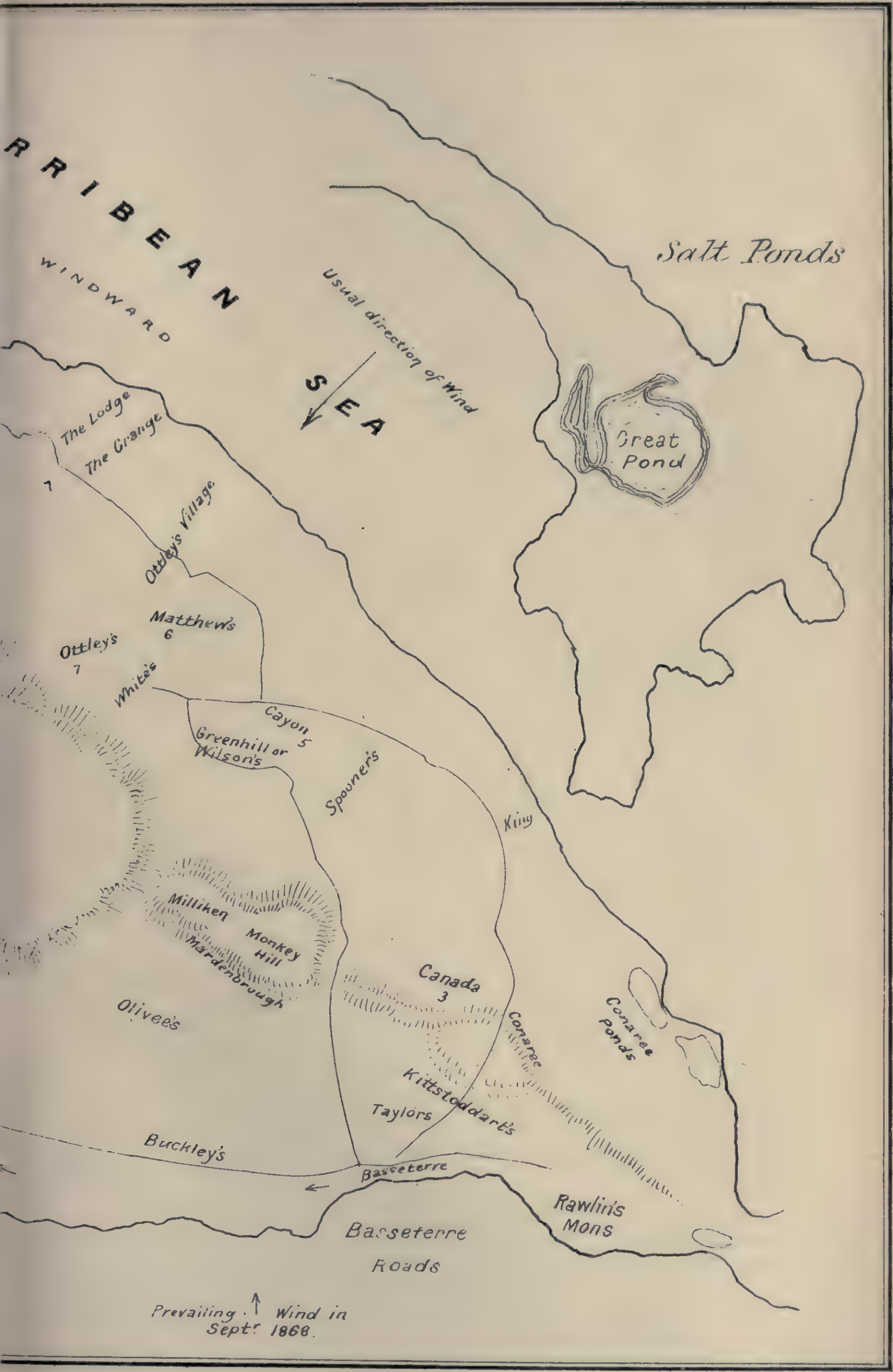


St. Kitts.

Road round Island 30 miles

The numbers indicate the miles from Town.

The Arrows indicate the common line of passage of the Yellow Fever unless when diverted or turned back by infection.


RRIBEAN
WINDWARD
SEA
Usual direction of Wind
Salt Ponds
Great Pond
The Lodge
The Grange
7
Ottley's Village
Matthew's
6
Ottley's
7
White's
Cayon
5
Greenhill or Wilson's
Spooner's
King
Milliken
Monkey Hill
Mardenborough
Canada
3
Conaree
Conaree Ponds
Olivee's
Kittstoddart's
Taylors
Buckley's
Basseterre
Basseterre Roads
Rawlin's Mons
Prevailing ↑ Wind in Sept^r 1868.

day. Now I had seen case 22 only nine days before, an ordinary period of incubation in this climate, and, from after consideration of the circumstances, am strongly inclined to think that the sweating (which I can account for in no other way) was caused by the fever-poison, which was thus thrown out of my system. It is probable that, had I been exposed to rain at any time during the nine days, and neglected to change my clothes, so as to prevent free perspiration, I would have had a severe attack of yellow fever. The Rev. Mr Millet's and D. Longhead's were both considered cases of masked yellow fever by Dr Semper, who attended them.

I may mention here that in a conversation I had very lately with Dr Branch, who saw case 99, Roland, a black man, he stated that he had some little doubt as to its being a case of pure yellow fever. It might, therefore, be considered as a doubtful case. My tables were made up before this conversation.

As I said in the beginning of the paper, I have no intention to enlarge on the question of treatment. The main point in it is, by all and any means available and reasonable, *promote perspiration*. A hot bath at once on the patient being seized may be (as in case 75 it proved) the stitch in time saving nine, which no activity in after-treatment can make up for the want of.

I append an outline map of the island, which it will be seen is simply a mountain-range, the two sides of which are cultivated as far as possible. I have marked the estates where yellow fever occurred. The dotted line indicates roughly the road round the island. The south-east end, Salt Ponds, has no road from the other part of the island, all the communication being by sea. There being no whites there, there was no yellow fever. In counting the distance from two such places as Wingfield and Matthew's, the distance by the road is of course taken, there being little or no communication over the mountains.

Having thus completed these, I fear very imperfect, notes of the late outbreak, I would like to finish by saying a few words as to former epidemics, so far as I have been able to ascertain anything about them. The want of registration of deaths, until 1859, makes it impossible to give anything very definite. Dr Swanston, a retired medical gentleman, who has been in the island more than fifty years, has told me that there was a very severe epidemic in 1818–19; there was another in 1829–30; another in 1836, chiefly among the soldiers of the garrison then stationed in the town, which may account for its returning in so short a time; another in 1848; and the last in 1858.

In all these epidemics one common character has been noticed: they have begun with Europeans, especially new-comers, and have been most deadly among them. In the last epidemic, 1858, a number of the Portuguese died as in 1868–69.

Now, on looking at these dates, it must at once strike any one that there is a regularity in the recurrence of the fever, which is quite certain to be seen in the island some time between every seven and twelve years. Making allowance, however, for the great difference in the liability to attack of a country in which there resides a garrison of one or two hundred white soldiers, as, in 1836, was the case here—most of these being new-comers—and of one in which no soldiers live (at present, and for many years back, there have been none in St Kitts), seeing that the soldiers were congregated in a barracks, making its spread certain; while of the fifty Europeans in the island in 1868, at least thirty were scattered over the country, the balance living in different houses in town, and of these only about a moiety being new-comers. Considering all these points, I think we are quite warranted in believing that the period between 1829–30 and 1836 was a curtailed one—not representing the normal period of recurrence. The normal (at least under the present sanitary conditions of the town) period of recurrence may be considered at ten years, while the minimum would be about eight, and the maximum twelve. This maximum could, I believe, be very much lengthened, if not indefinitely so, by some improved system of removal of fæces, and very strict attention on the part of the authorities to all sanitary laws, especially about the months of August and September, and particularly when these months are unusually hot, rainy, and with little or no wind. Some system of putting the sick in quarantine would also be useful, and prevent the spread of the disease when it had begun.

I may mention, that Dr St Vel of Martinique has found that yellow fever recurs in that island every eight or ten years—(O. St Vel, "Des Maladies Intertropicales," p. 289).

What I have pointed out in regard to the time of recurrence of the fever might be of some importance to young men, and those interested in them, coming out to this island to live. For the next eight years the chances of a young man living are positively much greater than in England, so long as he does not live a fast life, and kill himself with drink, there being no typhus, typhoid, or scarlet fevers to cut him off, and the dysentery not being much more severe than in England, while inflammatory diseases of the lungs are very rarely seen, compared with their constant occurrence in England. One coming out now, or within the next five years, would be quite acclimatized by the time yellow fever comes here again (probably about September 1878), and need, if at all careful of chills, have no fear of it. A man coming here about 1877 or 1878, however, would probably have to face an outbreak, or perhaps an epidemic, while still unacclimatized, and would therefore need to be particularly careful to avoid all causes of common fever, as it would be impossible to say whether it would not end in yellow fever and death.

The same observations apply with almost equal force to the immigration of Portuguese.

TABLE II.—[* indicates "unknown."]

Date of Seizure.	Name.	Age.	Complexion.	Native of	Residence.	Result.	Date of Death or Recovery.	No.	No. Dead.	No. Recovered.	Remarks.
1868.											
*	Emmanuel Pistana	7 years	Portugue	...	Basseterre	Died	Sept. 21.	1	1	...	
Oct. 18.	James Horne	19 yrs.	White	Scotland	„	Died	Oct. 23.	2	2	...	7 months in St Kitts.
Nov. 2.	Alexander Johnson	22 yrs.	„	Orkney	„	Died	Nov. 9.	3	3	...	$2\frac{1}{4}$ years in St Kitts.
„ 10.	William Gillie	21 yrs.	„	Scotland	„	Died	„ 16.	4	4	...	6 months in St Kitts.
„ *	Mr Fennel	Adult	„	England	„	Died	„ 25.	5	5	...	14 days in St Kitts.
„ *	Felician Fratas	28 yrs.	Portugue	Madeira	„	Died	„ 25.	6	6	...	
„ *	Louis Gumbs	Adult	„	„	„	Died	Dec. 4.	7	7	...	
Dec. *	Willie Laing	11 yrs.	White	Berbice, Demerara	Spooner's Cayon	Recovered	*	8	...	1	
„ *	Antoine Pistana	Adult	Portugue	Madeira	Basseterre	Died	„ 16.	9	8	0	
„ 14.	M. Le Blanc	28 yrs.	White	Canada	Rollin's Mons	Recovered	„ 20.	10	0	2	Five years in W. Indies, three [in Barbadoes.
„ *	Mr Lozack	Adult	„	England	Basseterre	Recovered	*	11	...	3	
„ *	Manoel Bresan	„	Portugue	Madeira	„	Died	„ 19.	12	9	...	
„ *	Mrs Slack	„	White	England	Mardenbrough	Recovered	*	13	...	4	About 16 years in St Kitts.
„ *	Mrs Jordan	„	Coloured	Barbadoes	Basseterre	Recovered	*	14	...	5	
„ *	Mrs Branch	„	White	„	„	Recovered	*	15	...	6	A slight attack.
„ *	Child of Mr Lagois	5 years	„	St Kitts	„	Recovered	*	16	...	7	
„ *	Mary Gumbs	Adult	Portugue	Madeira	Philip's	Recovered	*	17	...	8	Suphrine Gumbs' (*see* doubtful cases) stepmother. Case 18 died in Suphrine Gumbs' house.
„ 27	Alvine France	„	„	„	Ottley's Vill.	Died	1869. Jan. 2.	18	10	...	Two years in St Kitts.
1869.											
Jan. *	Coolie	„	Black	India	Upper Canada	Recovered	*	19	...	9	
„ *	Manoel Sobrana	„	Portugue	Madeira	Basseterre	Recovered	*	20	...	10	
„ 13.	Child of Mrs Slack	5 years	Coloured	St Kitts	Mardenbrough	Recovered	*	21	...	11	
„ 26.	Joseph Sainte	20 yrs.	Portugue	Madeira	Philip's	Died	„ 28.	22	11	...	40 hours illness.
Feb. 11.	Mr Marshall	Adult	White	England	Basseterre	Recovered	Feb. *	23	...	12	
„ 11.	Mr Merrin	„	„	America	„	Recovered	*	24	...	13	
„ *	Manoel Bresan	„	Portugue	Madeira	„	Recovered	*	25	...	14	

TABLE II.—*continued.*

Date of Seizure.	Name.	Age.	Complexion.	Native of	Residence.	Result.	Date of Death or Recovery.	No.	No. Dead.	No. Recovered.	Remarks.
1869.											
„ *	Mary Gumbs	Adult	Portugue	Madeira	Basseterre	Recovered	*	26	...	15	Brother and sister.
„ *	Paul Gumbs	18 yrs.	„	„	„	Recovered	*	27	...	16	
Feb. *	Manoel Bresan	10 yrs.	„	„	„	Recovered	...	28	...	17	Children of case 25.
Mar. 1.	Jose Bresan	5 years	„	St Kitts	„	Died	Mar. 8.	29	12	...	
Apr. 8.	Auguste Noon	Adult	„	Madeira	Alley, Sandy Pt.	Died	Apr. 11.	30	13	...	
8 to 14.	Thirteen Portuguese	...	...	at Big Sir Gillis	Sandy Point	1 died, 12 recovered	*	43	14	29	
„ 19.	Mrs Jose Gonsalve	Adult	Portugue	Madeira	„	Recovered	*	44	...	30	Attended Auguste Noon.
„ *	Jose Gonsalve	„	„	„	„	Recovered	*	45	...	31	Husband of case 44.
„ *	J. Gonsalve's shopman	„	„	„	„	Recovered	*	46	...	32	
May 8.	Jose *	„	„	„	O'Dane's Estate	Recovered	*	47	...	33	Saved by champagne.
„ *	Portuguese woman	„	„	„	Cayen, Sandy Pt.	Recovered	*	48	...	34	Bleeding from nose, etc.
„ *	Portuguese	„	„	„	O'Dane's Estate	Died	May 14.	49	15	...	Walking on the day he died.
„ *	Portuguese	„	„	„	„	Recovered	*	50	...	35	
„ *	Emmanuel de Ram	„	„	„	Lee's Estate	Died	„ 10.	51	16	...	Said to have visited Sir Gillis.
„ 12.	John Gonsalve	„	„	„	Hope Estate	Died	„ 17.	52	17	...	Visited Sir Gillis, and slept [a night there.
„ 12.	Two cases at Cranston's, and one at the Alley,				Sandy Point	Recovered	...	55	...	38	
June *	Mr Slack, jun.	Adult	Coloured	St Kitts	Conolly's	Died	June 9.	56	18	...	Died at Mardenbrough.
„ *	Antoine Gomez	10 yrs.	Portugue	Madeira	Willet's	Died	„ 15.	57	19	...	
„ *	Sailor on board barque in harbour of Basseterre				...	Recovered	*	58	...	39	
„ *	Antoine da Costa	22 yrs.	Portugue	Madeira	Basseterre	Died	„ 21.	59	20	...	
Aug. 10.	Caroline A. Curtis	3½ yrs.	White	St Kitts	Boyd's Estate	Died	Aug. 12.	60	21	...	36 hours' illness.
„ *	Charles Danver	Adult	„	England	Hospital	Died	„ 16.	61	22	...	English sailor.
Sept. 2.	Two children of Mrs Arnold	...	„	St Kitts	Kittstoddart's	Recovered	Sept. *	63	...	41	
„ *	— Mendoza	14 yrs.	Portugue	*	Clevelly Hill, Sandy Point	Died	„ 20.	64	23	...	
„ *	John de Crosse	Adult	„	Madeira	Bevin Island	Died	„ 27.	65	24	...	
„ *	Francis John	„	„	„	Lynch's	Died	„ 27.	66	25	...	Visited last case.

TABLE II.—*continued.*

Date of Seizure.	Name.	Age.	Com-plexion.	Native of	Residence.	Result.	Date of Death or Recovery.	No.	No. Dead.	No. Re-covered.	Remarks.
1869.											
Sept. *	Two children of Francis John	...	...	St Kitts	Lynch's	Recovered	*	68	...	43	Had black vomit.
Oct. 3.	Miss Tony	Adult	White	Barbadoes	Sir Gillis's	Recovered	*	69	...	44	Removed after seizure to Old Road.
,, 5.	Mr Joseph Evelyn	,,	White	,,	Wingfield	Died	Oct. 10.	70	26	...	
,, 8.	Mr G. Pamento	,,	White	England	Lynch's	Died	,, 14.	71	27	...	10 years in St Kitts.
,, *	Maria Baptiste	,,	Portugue	Madeira	Estridge's	Died	,, 17.	72	28	...	Was at funeral of case 65.
,, *	Portugue man & wife	,,	,,	,,	Parson's	Recovered	*	74	...	46	
,, *	Mr Edward Evelyn	,,	White	Barbadoes	Matthew's	Recovered	*	75	...	47	
,, 24.	Joseph Branamse	Adult	Portugue	Madeira	,,	Died	Oct. 29.	76	29	...	
,, 28.	John Fratas	21 yrs.	,,	,,	White's	Died	Nov. 2.	77	30	...	
Nov. 4.	MaryJulie Fernandez	7 years	,,	*	Matthew's	Died	,, 9.	78	31	...	
,, 8.	Antoine Fernandez	9 years	,,	*	,,	Died	,, 12.	79	32	...	
,, *	Mrs Lyon's child	*	White	America	Basseterre	Recovered	,, 12.	80	...	48	
,, *	Mr William Evelyn	Adult	,,	Barbadoes	Heldon's	Died	,, 13.	81	33	...	
,, *	Mrs Lyon	,,	,,	Scotland	Basseterre	Recovered	,, 17.	82	...	49	
,, 10.	Mary Andrad	,,	Portugue	Madeira	Caine's	Died	,, 17.	83	34	...	
,, *	Theodore Andrad	,,	,,	,,	Parson's	Recovered	*	84	...	50	No relation to Mary Andrad.
,, 15.	Joseph Pistana	,,	,,	,,	Rollin's	Recovered	*	85	...	51	Visited Theodore Andrad.
	Joachim Fernandez	,,	,,	,,	Matthew's	Died	Nov. 19.	86	35	...	
,, *	Two children of the late Mr W. Evelyn	...	Coloured	Barbadoes	Heldon's	Recovered	*	88	...	53	
,, *	Nephew of Mr W. Evelyn	Adult	White	,,	,,	Recovered	*	89	...	54	
,, *	Alfred Gumbs	13 yrs.	Portugue	*	Olivee's	Died	Nov. 26.	90	36	...	
,, 24.	Mary Pistana	Adult	,,	Madeira	Rollin's	Recovered	...	91	...	55	Wife of case 85.
,, 30.	Antoine Baptiste	,,	,,	,,	Matthew's	Died	Dec. 5.	92	37	...	
Dec. 3.	Mr Grimes	,,	White	England	Taylor's	Died	,, 6.	93	38	...	Visited Lynch's a few days before.
,, 5.	Mrs M. Arthur	,,	,,	St Kitts	Harris's	Recovered	*	94	...	56	30 years in St Kitts.
,, *	Two other children	of the	late Mr	W. Evelyn	Matthew's	Recovered	*	95	...	58	

TABLE II.—*continued.*

Date of Seizure.	Name.	Age.	Complexion.	Native of	Residence.	Result.	Date of Death or Recovery.	No.	No. Dead.	No. Recovered.	Remarks.
1869.											
Dec. *	Mrs W. Evelyn	Adult	Coloured	Barbadoes	Matthew's	Recovered	...	97	...	59	
„ *	Mrs T. Howe	„	White	St Kitts	Greenhill	Recovered	...	98	*	60	Visited Mrs W. Evelyn when [sick.
„ *	— Roland	„	Black	...	Milliken	Died	Dec. 25.	99	39	6	
„ *	Servant girl	„	Coloured	St Kitts	Matthew's	Recovered	...	100	*	61	
1870.											
Jan. 1.	Antoine Farnance	38 yrs.	Portugue	Madeira	„	Died	Jan. 3.	101	40	...	
„ 3	Mr W. Guy	22 yrs.	White	Barbadoes	White's	Died	„ 8.	102	41	...	Taken sick at Matthew's.
„ 3	Esperina Farnance	14 yrs.	Portugue	*	Basseterre	Died	„ 8.	103	42	...	Black vomit, albumin. urine.
„ *	John Gomez	Adult	„	Madeira	Stonefort	Died	„ 8.	104	43	...	
	John Shandra	„	„	„	„	Recovered	*	105	...	62	
„ 6.	Maria Francis	„	„	„	„	Recovered	*	106	...	63	
„ 10.	Augustus Rodigue	4 years	„	*	Old Road	Recovered	*	107	...	64	
„ 14.	Francis Smith	14 yrs.	White	St Kitts	Basseterre	Died	Jan. 28.	108	44	...	At day-school near case 103.

DOUBTFUL CASES.

Date of Seizure.	Name.	Age.	Complexion.	Native of	Residence.	Result.	Date of Death or Recovery.	No.	No. Dead.	No. Recovered.	Remarks.
1869.											
Jan.	Suphrine Gumbs and		Portu-	Madeira	...	...	...	...	...	...	Case 18 died in his house, and
	wife and children	...	guese	St Kitts	Ottley's Vill.	Recovered	...	...	...	...	he is the stepson of case 17.
Feb. 5.	W. Munro	Adult	White	Scotland	Baker's	Recovered	Feb. 6.	...	...	...	Saw case 22 nine days previously, when in a state of collapse, and vomiting black vomit.
...	D. Longhead	„	„	Ireland	Old Road	Recovered	...	...	...	...	
Nov.	Rev. Mr Millet	„	„	England	Dieppe Bay	Recovered	...	...	...	...	
Dec.	Portuguese woman	„	„	Madeira	Taylor's	Recovered	...	...	...	...	Shortly after Mr Grimes's death.

TABLE III.

Month.		1867.	1868.	1869.
Jan.	Mean	80°·75 F. For month of three observations daily.	80°·47 F. In 1868 and 1869, of two observations daily.	80°·30.
	Wind	Variable, light, and moderate	E. and N.E., fresh and strong	Fresh to 13th; thereafter light and moderate; gen. E. and N.E.
Feb.	Mean	78°·89	80°·25	80°·60
	Wind	Variable, light, strong, and squally	E. and E.N.E., fresh and moderate	Generally E. and S.E.; light and moderate, but fresh from 21st to 23d
March	Mean	81°·03	80°·00	79°·88
	Wind	Easterly, light, and moderate	E. and E.N.E., light and moderate	Light and mod., but fresh from 9th to 12th; chiefly E.N.E. and N.E.
April	Mean	84°·30	81°·80	83°·00
	Wind	Light to fresh, E.	E., light to fresh	Light and mod., chiefly E.S.E. and S.W.
May	Mean	84°·3	82°·56	84°·68
	Wind	E. and S.E., mod. and light	E. and S.E., mod. and light	S.E. and E. by S., mod. and light
June	Mean	83°·40	85°·06	85°·00
	Wind	E. and S.E., mod. and fresh	E. and E.N.E., mod. and fresh	E., mod. and fresh
July	Mean	84°·79	84°·93	84°·73
	Wind	E., mod. and light	E.N.E. and E., mod. and fresh	E., mod.; heavy gale on 28th and 29th
Aug.	Mean	85°·16	85°·59	86°·35
	Highest	88°·0 often	89°·0 on 31st;	89°·0 often
	Lowest	80°·0 on 25th and 82°·0 31st	88°·0 on 29th and 30th	82°·0 on 25th
	Wind	E. and E.N.E., light and fresh	Easterly, light and moderate; fresh on 11th	E., light and moderate

TABLE III.—*continued.*

Month.		1867.	1868.	1869.
Sept.	Mean	82°·10	84°·6	85°·50
	Highest	87°·0 often	88°·0 on 1st, at 2 P.M.	90°·0 on 9th and 13th (often 89°).
	Lowest	80° on 9th, with wind at E.S.E., strong	81°·0 at 10 A.M. on 10th	76°.0 on 27th
	Wind	Light to strong, heavy squall on night of 8th	S. and S.E., light and mod.; thunder and lightning on 2d & 9th	Variable, light
Oct.	Mean	84°·05	85°·03	83°·44
	Highest	87° often	87°·0 often	88°·0 on 31st
	Lowest	80° often	78°·0 at 10 A.M. on 10th	80°·0 on 7th, at 9 A.M.
	Wind	E., mod. or light	Easterly, light and moderate	E. and E.N.E., mod. and light
Nov.	Mean	83°·60	84°·0	83°·96
	Highest	87°·0 on 1st	87°·0 often	87° from 10th to 14th.
	Lowest	78°·0 on 11th	77°·0 on 11th, cloudy	78° on 20th
	Wind	N.E. and E.N.E., moderate	Light and moderate	Mod. to fresh; squally on 16th, 17th, and 29th
Dec.	Mean	82°·36	82°·63	80°·90
	Highest	85°·0 on 5th & 6th	86°·0 on 2d, at 2 P.M.	86·0 often
	Lowest	78°·0 very often	77°·0 on 5th, at 10 A.M.	76°·0 on 22d
	Wind	E. and E.N.E., mod. to fresh; squally on 31st	W., light to strong; E. and S.E.	E. and N.E., mod. to strong

TABLE IV.—RAINFALL IN INCHES.

Month.	1866.	1867.	1868.	1869.
January	5·95	1·75	3·45	1·40
February	1·60	1·95	1·10	0·45
March	2·90	1·90	3·60	1·75
April	3·25	2·80	0·65	0·70
May	6·00	8·10	1·15	1·50
June	4·90	6·35	0·80	3·40
July	3·20	3·65	2·95	3·95
August	2·85	3·53	2·45	4·30
September	4·95	4·05	10·05	9·75
October	8·40	3·35	5·85	8·75
November	2·10	6·85	4·90	5·40
December	2·65	4·05	3·05	1·30
Total	48·75	48·35	40·00	42·65

Note to Thermometrical Observations.—September 1868 was the month in which the hottest days of two years' observations taken by myself, on the windward side of the island, occurred. On the 31st August and 1st September it stood at 87° F., the hottest before or after being 86°, and the ordinary highest 83° in the hottest months. I have recorded it as low as 68° in March.

Note to Rainfall Observations.—8·15 in. of the 10·05 in. which fell in September 1868 fell on or before the 15th, making this the wettest half of the rainiest month of the four years. Of this 8·15 in. 2·45 in. fell on the 12th, and 2·10 in. on the 15th. No such days of rain occurred before, from the beginning of 1866, except that on the 5th March 1868, when 2·10 in. fell. Only one day exceeded them in the four years, viz., the 25th September 1869, when 3·05 in. fell. This, it may be observed, was the next most rainy month of the four years, and while the first outbreak of yellow fever happened in September 1868, it broke out afresh in September 1869, after a very decided break.

TABLE V.—HIGHEST AND LOWEST BAROMETRIC PRESSURES IN SEPTEMBER

	1866.	1867.	1868.	1869.
Highest,	30·02 on 5th and 6th.	30·03	29·98 on 5th.	29·97
Medium,	29·99	29·96	29·85	29·93
Lowest,	29·65 at 6 A.M. on 29th	29·92	29·80 on 10th.	29·81 on 25th.

N.B.—By "medium" range I mean that which occurred oftenest. The range between the 10th and 18th September stood between 29·80 on the 10th, and 29·96 on the 18th, in 1868. To give an idea of the usual range of the barometer here, I append the maxima and minima for the four years, with the months in which they occurred.

	1866.	1867.	1868.	1869.
Highest,	30·10 on 10th June.	30·10 in February.	30·09 in June.	30·10 in June.
Lowest,	29·65 in September.	29·80 in Oct. & Nov.	28·80 on 10th Sept.	29·74 in December.

September to December are the months of lowest barometric pressure, and it is to be remarked that in 1868, this was the month in which the minimum was reached, *only* a few days before the fever broke out, while it was at the same time the lowest in comparison with the pressure in the same months of the other years quoted.

ARTICLE III.—*A few Cursory Remarks upon the Treatment of some of the Specific and Septic Fevers.* By F. PAGE ATKINSON, M.D., etc., late Surgeon St Bartholomew's Hospital, Chatham, and Royal South London Dispensary.

IT is often curious to hear what diametrically opposite views are expressed by medical men as regards the treatment of disease; and to observe, how, for the same disorders, restoratives and stimulants are strongly recommended by some, and depressants by others. Unfortunately, there can be no doubt that this difference of opinion (which arises either from our ignorance as to what the nature of disease really is—whether, in fact, it is an exhibition of weakness or strength—or to our uncertainty as to the best method of setting right the altered balance of function or power) seriously interferes with the wellbeing of the profession, and has a tendency to lessen the confidence which the public ought to feel, individually and collectively, in the means taken to relieve disease and prolong life.

The arguments used by those in favour of bloodletting are:—

1. It gives relief to pain.
2. It diminishes swelling, and local redness, or congestion.
3. It temporarily diminishes abnormal heat.
4. Natural hæmorrhage is sometimes the turning-point of disease, and artificial loss of blood being equivalent to spontaneous may replace it.

Those, on the other hand, who advocate a supporting and stimulating line of treatment say,—

1. Every disease has a tendency to go on towards recovery, provided the patient be properly supported.
2. If no patients are bled at all, more recover than if all are bled, who have the collection of symptoms considered by experience to be benefited by venesection.
3. If no patients are bled at all, more recover than if all are bled, in whom sundry morbid changes of special parts are discovered.
4. The quick dicrotic irregular pulse, the hot burning skin, and the delirium, are signs of excessive *waste* of tissue.
5. The excessive waste or oxidation of tissue can only be met by support, and pouring into the system something (as for instance alcohol) which can easily be oxidized in its stead, or by neutralizing the material in the system which produces the increased waste; and I must say the force of argument undoubtedly seems to be on their side; at any rate, those who continue to place faith in bloodletting and a depressing line of treatment have yet to show they are right, by means of sphygmographic tracings and thermometric charts.

That certain cases recover upon a low diet, and without the use of stimulants, there can be no doubt; but this is no proof of the correctness of such a line of treatment. Of course, no one would for one moment venture to assert that stimulants are required in every particular instance, because such an assertion would indicate an entire ignorance of the subject, and a disbelief in the value of those symptoms, and in the utility of those instruments of precision upon which we now rely so much; but what is affirmed most positively is, that stimulants are required in a great proportion of cases, especially those of fever, fatty and valvular disease of the heart, inflammation of the lungs, etc., and that without them very many patients do badly. The reason I believe why many persons doubt the efficacy of stimulants is that they administer them at the wrong time, or in too great quantity.

But in addition to this difference of opinion concerning blood-letting and the employment of resoratives, there often appears to be but little accord amongst medical men as regards the general treatment of disease. This I think arises from—

1. Ignorance regarding the real action of drugs, *e.g.*, mercury.
2. Several drugs having more or less the same action, and the differences in action not being sufficiently explained, *e.g.*, cinchonine and quinine.
3. Ignorance regarding the pathology of disease, *e.g.*, diabetes.
4. Deficient primary medical education.

In order to be able to treat disease properly, we ought to have a clear understanding upon the following points:—

1. The nature of the ailment; *i.e.*, we must diagnose the case properly.
2. The condition of the organ or organs involved, the steps by which it or they have arrived at it, or their present condition (or, we must know the pathology of the disease).
3. The cause (or in other words the etiology) of the disease.
4. The action of the drugs with which we have to deal.

Take for instance a case of pneumonia, and let us analyze it in the manner described: the air-cells of the lungs are filled and distended with molecular matter. The cause has been cold, suppressing perspiration, throwing back an increased quantity of blood into the lung, and at last causing exudation of blood-corpuscles. What we have here to do is to restore the action of the skin, or, in other words, to get the system to retrace the morbid steps it has just taken. This is to be accomplised by means of warmth in the shape of linseed-meal poultices applied to the surface of the chest, and the administration of diaphoretics. In addition to this, where the pulse is dicrotic and the temperature high, alcohol should be prescribed in order to prevent the exudation of blood-corpuscles from the vascular walls, and afterwards to stop the transformation of exuded matter into pus. In cases of blood-poisoning, *e.g.*, fever where we are unable to make out the exact nature of the disturbing element, all we can do is to support life, and treat any bad symptoms that may arise. All remedies that have been at various times proposed as specifics in these cases have been found, on extended experience, to have little or nothing to recommend them beyond those that were already in use. Still, notwithstanding that every fever has a tendency to run a certain course—and nothing has as yet been discovered for rendering the duration shorter—we have it most undoubtedly in our power to mitigate the severity of the attack. In speaking of the treatment of fevers, I shall first describe that which is applicable to all fevers alike, and then that which is more or less special to each. But before doing this I shall make a few quotations regarding the nature of pyrexia, from Dr Gee's excellent lectures, just delivered at the Royal College of Physicians, London:—"The healthy body," he says, "possesses a power of keeping up a mean temperature of 99 degrees; to this end the amount of heat generated and the amount dispersed are both under control. In pyrexia this regulating function is disturbed in two ways:—

"1*st.* The standard of mean temperature which the body strives to maintain is pitched higher.

"2*d.* The powers by which the body keeps up the standard are weakened.

"At the onset of pyrexia, in the cold stage, when the standard of mean temperature rises rapidly, the vessels of the skin contract, so as to prevent any loss of heat equivalent to the augumented production; in the healthy state, the cutaneous vessels would, of course, relax under such circumstances. When the actual temperature has reached the ideal febrile standard set up, the generation and loss of heat become adjusted so as to maintain this morbid temperature: this is the hot stage. Lastly, as soon as the standard falls, a sweat breaks out, whereby to bring the febrile heat down to the normal as quickly as possible." It is perfectly clear, from these remarks, that it is important to obtain a free action of the skin at the commencement of all febrile attacks. This, I think, is most readily accomplished by administering the following mixtures in a state of effervescence every three or four hours:—Bicarbonate of potash, 20 grains; aromatic spirits of ammonia, 15 minims; spirits of nitrous ether, 15 minims. Water to the ounce. And, Citric acid, 15 grains; spirits of chloroform, 15 minims. Water to the half-ounce. The carbonic acid here given off acts as a direct sedative to the nervous system. The resulting citrate, by becoming changed in the system into a carbonate, takes up a certain quantity of oxygen; the ether also becomes oxidized in the place of the nervous tissue, and at the same time tends to lessen the temperature by relaxing the vessels of the skin. Purgatives in the early stage of fevers should be avoided, since harm, instead of good, is nearly certain to result if the case eventually turns out to be one of typhoid. Wine, I think, is rarely required till later on in the disease. Beef-tea should be given frequently, in order that the system may be able to pass through that stage of exhaustion which is certain to follow sooner or later. As soon as the fever has become fully developed, of course, treatment has to be applied to meet the particular necessities of the case.

In smallpox, our attention has to be directed mainly towards limiting suppuration. This, I think, can be accomplished by excluding all light from the apartment, and using a candle when it is requisite to look at the patient. (The exclusion of the actinic rays lessens suppuration as well as fever.) Smearing over the vesicles with collodion, a solution of gutta-percha in chloroform, or a paste made of carbonate of zinc 3 parts, oxide of zinc 1 part, and olive oil (as recommended by Dr Bennett)—by either of these processes air is excluded from the inflamed surfaces, and the inflammatory action lessened. (The exclusion of air I consider to play an important part in Lister's method of dressing.[1]) Administering alcohol internally, and some such mixture as the following every three or four hours:—solution of perchloride of iron, 15 minims; muriate of cinchonine, 4 grains; chlorate of potash, 10 grains; spirits of chloroform, 15 minims; water to the ounce. The alcohol tends to stop the exudation of blood-corpuscles from the vascular walls and the transformation of exuded matter into pus. Cinchonine is antiseptic in its properties, the same as alcohol. The iron is a blood-restorer, antiseptic, and controls capillary circulation. Chlorate of potash is a blood-purifier. In the next place, as this, in common with all other fevers, is supposed to be due to the presence of atmospheric germs, the room should be constantly undergoing fumigation with such materials as carbolic or sulphurous acid or iodine. It is certainly a great pity to see such a disease existing at all, for there can be no doubt that if vaccination and revaccination were regularly and efficiently carried out, it might be completely swept away. Unfortunately, however, some persons, in spite of all that is said by competent authorities, remain firmly opposed to such methods of prevention, though they are altogether unable to give any reason why or wherefore.

In scarlatina, our chief anxiety is with regard to the throat. As long as the ulceration is not very extensive the patient can be kept up by support; but when this is very severe, nourishment can only be taken with difficulty, and the patient sometimes sinks from sheer exhaustion. In order, then, to cleanse the throat and stop the increase of germs, upon which the disease is supposed to depend, we order some such medicine as the following:—Dilute nitric acid, 15 minims; solution of perchloride of iron, 15 minims; chlorate of potash, 10 grains; spirits of chloroform, 15 minims; water to the ounce; to be taken every three or four hours. The chlorine which is here given off is known to have distinct antiseptic properties. A gargle also, consisting of 20 minims of tincture of iodine to the ounce of water, should be used frequently (it need only be held in the mouth while the head is shaking from side to side); and the room should be fumigated with sulphurous acid. Support is necessary in the shape of beef-tea and wine. When the skin is very hot and dry, I often administer solution of acetate of ammonia, half an ounce;

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[1] The exclusion of air forms no part of Mr Lister's treatment. *Vide* Journal for August, p. 150.—Ed. *E. M. J.*

chlorate of potash, 10 grains; and water to the ounce; every three or four hours. The acetate, when taken into the system, relaxes the cutaneous vessels and becomes changed into a carbonate. During the process it takes up a certain quantity of oxygen. In this condition cold baths, or successive packings in wet sheets, are strongly recommended by some, in order to lessen the tendency to lethargy, phrenzy, putridity, and debility. The method of applying the cold-water packing is as follows:—Two beds are arranged side by side, and on each is spread a blanket which has been dipped in cold water. The patient, placed on one of these blankets, is enveloped in the wet blanket and covered with a dry one. After ten or fifteen minutes he is removed to the other bed, and treated in the same way. This change is repeated from four to six times, and if indicated by the symptoms, the measure may be repeated after intervals of twelve hours. Quoting again from Dr Gee's Lectures,—"The manner in which the augmented generation of heat in pyrexia is diminished by cold baths may be explained thus:—first, the fall of temperature which follows after moderate abstraction of heat in a healthy person occurs in fever patients also. The temperature rises at first during the bath, but a lowering of the body heat soon follows, and the depression of temperature lasts longer than the elevation; yet in severe pyrexia the depression soon passes off, so that the baths must be repeated in order to produce a decided cooling effect. Secondly, the temperature rises during the bath for a time certainly, but fever patients lose more heat during this period than healthy persons do. Moreover, the power to counteract cooling by spontaneous augmentation of heat generated—a power which is limited in health—in fever is still more limited; that is to say, under great abstraction of heat, less heat is produced in fever than in health. Hence, not only is the frigorific effect of the bath greater, but its calorific action is less in fever patients than in healthy people; more heat can be abstracted from the pyretic, and their power of maintaining a standard temperature is more easily overcome." The difference between the action of the cold bath and alcohol appears to be this:—The cold bath lessens oxygenation of tissue by lessening the supply of oxygen. Alcohol lessens oxygenation of tissue by supplying material capable of being oxidized in its stead.

In typhus fever, we have more especially to consider the condition of the brain. Medicine is of little use, and reliance must chiefly be laid upon the use of cold baths. Severe headache and delirium may be also relieved by the application of ether spray or ice to the forehead. For producing a quiet refreshing sleep, hydrate of chloral or bromide of potassium should be prescribed in preference to opium. The apartment in this, as well as in all other fevers, should be thoroughly well ventilated, and there should also be exclusion of light. Support in the shape of beef-tea, milk, curds and whey, eggs, jelly, wine, should be given frequently. The last-mentioned is best administered in small and oft-repeated doses.

In typhoid fever, we have to look mostly after the state of the bowels. If there is tenderness in the right groin, a mustard-poultice should be applied to this region. Diarrhœa, if excessive, should be restrained, but if only slight, left alone. If the tongue is very brown and tremulous, or there is any melæna, from 7 to 10 minims of turpentine may be given in a little mucilage, every three or four hours. It acts as a direct stimulant to the nervous system, and contracts the bleeding capillaries. Most reliance should be placed upon support, as medicine seems to be of little effect. Milk should be given in preference to beef-tea, and brandy to port wine. Raw eggs, corn-flour (made like blancmange), and jelly, may be given with advantage. Perfect rest on the back is of special importance. During convalescence, great attention should be paid both with regard to exercise and food. Too early exercise, or too early a return to solid food, may cause a most serious lesion-rupture of the bowels.

These are all the remarks I intend to make in the present paper, and, though short, I think they are sufficient to show that medical men do not, as is asserted, act in an entirely empirical manner, but they are able in nearly all cases, when required, to give some satisfactory explanation of the principles upon which they act. The man who prescribes what his forefathers recommended, simply upon the faith of blind experience, without inquiring for himself as to the why and wherefore, cannot but fall into the rear ranks of his profession, and prove a stumbling-block in the way of a general advance. Not only should we take into consideration the nature, pathology, and cause of each disease, but reason carefully upon the *modus operandi* of all medicines which we or others should propose for its cure. By so doing, we shall not only reap benefit ourselves, but most certainly advance the position of the profession to which we belong.

ARTICLE IV.—*The Normal Products of Hepatic Action.* By Dr JOHN G. MACVICAR, Moffat.

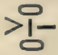
PART II.—Cholesterine. Choline, Neurine. Protagon. Dyslysine. Cholic, Glycocholic, and Taurocholic Acids. Acetic and Lactic Acids (a Digression). Tissue and Colorific Elements, Biliverdine, Cholophœine.

CHOLESTERINE.

IN what has preceded (see this Journal for August 1871, p. 128) we have the elements CHO when aggregating into a group of 12, giving what, for want of a more comprehensive generic term, we have called the glycogenic molecule. But this molecule results only when these elements aggregate with the carbon or oxygen centrad. When, on the contrary, the hydrogen is centrad, the molecule must consist of 4 members only, or possibly of 8, and ultimately and most perfectly of 20. Of the last, the icosatom, I shall say nothing here.

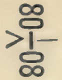
because (excluding albumenoid substances) the products of hepatic action do not appear to give molecules of a more composite structure than the dodecatom or the tetratom. We have already obtained certain products which are dodecatom, *i.e.*, we shall have to return to the dodecatom, for it is constantly recurring; but, for the present, we must turn our attention to the tetratom, *i.e.*, the molecule of four members.

The simplest of the type of the tetratom is that of 4 atoms of hydrogen, one standing as an axis for the other three, which lie at right angles to it, on the trigonal equator of the axial atom of hydrogen, and form three equatorial radii or arms. As might be expected of such a highly volatile and elastic element as hydrogen, this tetratom of hydrogen by itself cannot be condensed or retained in any kind of groupings or molecules at the surface of our planet. But when the tetratom is steadied by an atom of such a fixed element as carbon on each pole we have it; for there is then—

Marsh gas, . . .  $C_2 H_4$

This, when the three equatorial arms are substituted by chlorine, gives chloroform, and explains a multitude of phenomena of chemical substitution in the laboratory, in which three atoms of hydrogen, neither more nor less, are so frank in departing and submitting to substitution, while a fourth resists and remains.

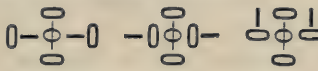
When brought into harmony with the oxygen (which is present universally in the terraqueous globe, except in a very few substances), by placing an atom of oxygen on each pole so that the poles are atoms of carbonic oxide, instead of merely carbon, we obtain the symmetrical state of—

Methylic alcohol,  $C_2 H_4 O_2$

And of this we shall soon see the occurrence as a polar element in a beautiful product of hepatic action.

Marsh gas in the free state is rather an ultimate type and redintegrate of primeval genetic molecular action than a substance belonging to the condensed, the concrete, the organized sphere. Viewed in reference to that sphere, so little carbon with so much hydrogen is unnatural. Rather we are to expect that, instead of escaping with 3 hydrogen points naked, each of them will carry an atom of carbon, so that when all the oxygen has succeeded in escaping, we shall have as the lightest and least hydro-carbon of living nature, and as the product of the last vital analysis, a structure, the formula of its element $C_2 H_4 \times C_3 = C_5 H_4$.

But the molecular structure corresponding to such a numerical ratio of carbon and hydrogen is polymorphous in a high degree. This formula will therefore stand for many substances of different properties. But all of these structures when single are oblate in form. Hence they will tend to aggregate again into such molecules as their far-extending equators determine. Now, these equators are trigonal. The molecules, provided they be isometrical, will therefore be tetratoms and icosatoms. Now, of these the simpler gives the well-known formula of $C_{20} H_{16} = 4 (C_5 H_4)$; and I have elsewhere[1] shown how completely this structure explains the phenomena of the non-oxygenated essential oils; with regard to which, indeed, M. Cahours has shown that, along with $C_{20} H_{16}$, it is necessary to assume the groupings $C_{15} H_{12}$ and $C_{10} H_8$, leading to our structure $C_5 H_4$ as the unit of the series.

An atom of essence,  etc. = $C_5 H_4$

Such structures, then, under vast varieties of forms, and usually, no doubt, in coupled atoms, like the elements of the atmosphere itself, are everywhere escaping from the mature parts of vegetable nature into the atmosphere.

To their escape the vegetable kingdom mainly owes its fragrance.

If, then, our theory of hepatic action be sound, we must expect some hydro-carbons of the same kind as its product. It is not to be forgotten, however, that there is such a vast difference between the organism of a plant or flower, so exquisitely expanded in the thin air under the genial radiance of the sunbeam, and that of the liver, crowded into a dark compartment inside the ribs, overlaid by the diaphragm, and by it cut off from all chance of communicating with the air, that it would be too sanguine to expect a hydrocarbon similarly to escape merely as fragrance from the liver. Rather we are to expect that in this viscus the fragrant elements will be packed together into some stable molecule, which will be persistently concrete, and therefore shall have little or nothing to give to the air, or to the olfactory nerves when snuffing the air.

Suppose, for instance, that the atoms of CH on the equator of $C_5 H_4$ were united so that they shall be parallel to the atoms of C and H, which form the axis of the combination, as (though not well) is figured on the right hand in the preceding diagrams, then each molecule of $C_5 H_4$ would be dissymmetrical, and therefore uninsulable by itself. Moreover, the equator would not project so far as to prevent their uniting into dodecatoms, that is, into the most stable kind of molecule. Suppose, then, that we have a dodecatom, composed of such elements in couples as its body, and differentiated on the poles by two atoms of oxygen, one to give fixity to the nucleus (by differentiation), and the other to protect from the further attacks of ambient oxygen, with an atom of marsh gas supporting each—that is, suppose we have for the molecule a body consisting of concreted essence, and poles of methylic spirit—we thus obtain a beautiful structure which gives the formula of—

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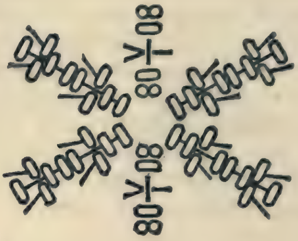
[1] A Sketch of a Philosophy, P. III., p. 77. Williams and Norgate.

Cholesterine,



$2\,(C_{52}H_{44}O_2)$

And here the necessity of having recourse to a woodcut has enabled us to place the equatorial atoms of carbon more correctly on the trigonal equator of the atoms of hydrogen. Why the molecule should give double the chemical formula has been already explained. And if we were to dwell upon it, we might show how well this molecule explains the characters and modes and places of occurrence in the organism of this beautiful but formidable substance, which is met with, not only in the liver, the gall-bladder and its ducts, but in the brain, the blood, etc., as also in the vegetable kingdom.

If it could be resolved into its organic elements without the decomposition of these elements, and if the equatorial elements could be reconstructed into one molecule, and the polar elements obtained separate, an atom of cholesterine would give—

1. Atom of heavy essential oil, $20\,(C_5\,H_4) = C_{100}\,H_{80}$
2. Atoms of methylic alchohol, $2\,(C_2\,H_4\,O_2) = \underline{C_4\,H_8\,O_4}$

Cholesterine, . . . $2\,(C_{52}\,H_{44}\,O_2) = C_{104}\,H_{88}\,O_4$

According to this view, then, the habitual use of condiments, carminatives, etc., is not a trivial matter in a hygienic point of view. And, in reference to hepatic action, the essential oils, camphor, etc., when judiciously used, ought to be valuable medicines.

CHOLINE. NEURINE. PROTAGON.

It has been supposed, in what has preceded, that the only bond of union between the two atoms of essence $(C_5\,H_4)$ which, when united, form the members or radii in the dodecatom of cholesterine is the dissymmetry of each, forbidding each to exist separately, and not in lesser groups than a couple, which is the simplest combination that gives symmetry. But the atom of essence may also itself have a symmetrical structure, as, indeed, it has in the first two diagrams that have been given of it above. And in this case, in order to bind a couple strongly together, some other element as a coupling joint is required; for the oblate form of each element of essence, though it must tend to bring them together in couples, and to keep them together while the conditions in which union took place continue to subsist, yet the coupled element must be liable to easy dedoubling and dissolution when these conditions are changed.

Hence an important part is played, both in nature and the laboratory, by a class of elemental forms which may be generally designated *coupling joints*.

Of these, the most important is oxygen, whose form, were we to go into the genesis of the elements on the principles of our molecular morphology, we should find to come out so that it resembles a doubly concave lens, a blood-disk, or a life-buoy. It is, therefore, admirably suited to serve as a coupling joint for structures whose poles are carbons or similar forms, for these may be said to resemble a convex lens, so that, with regard to oxygen and them, each is a mould for the other, like the glasses in a triple achromatic arrangement in an optical instrument.

The atom of oxygen, when acting as a coupling joint, exists often alone, and, indeed, in this case often binds the two elements in its poles on opposite sides so firmly together that they are wholly undecomposable in the laboratory, and only secularly decomposable during the lapse of long ages under the sustained action of the analytical energy of nature.

But where, instead of merely dry oxygen, moisture is present, and still better, when moisture and ammonia are present, a finer coupling joint may be constructed. In this case the atoms of O in HO form the poles of the coupling joint, while the atoms of H are inserted in the poles of an atom of *aq* or of *am* which forms the equatorial part of the coupling joint—the poles in both *aq* and *am* being negative or re-entrant and conformable for receiving the atoms of H of HO. We thus obtain as equatorial coupling joints or nuclei for axial forms—

The Aqueous coupling joint, $\begin{array}{c}\infty\\|\\*\\|\\\infty\end{array}$ or $\begin{array}{c}\infty\\*\\\infty\end{array} = \mathrm{OH\ aq\ HO} = 3\,\mathrm{HO}$

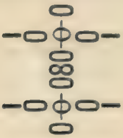
The Ammoniacal coupling joint, $\begin{array}{c}\infty\\|\\*\\|\\*\\|\\\infty\end{array}$ or $\begin{array}{c}\infty\\*\\*\\\infty\end{array} = \mathrm{OH\ am\ HO} = \mathrm{Az}\,H_5\,O_2$

As examples of the first and second, consisting of pure oxygen and aqueous matters, we may take the camphors of nature and of the laboratory. Contrary to what usually happens, however, our formulæ in this case are halves of those of the chemist, he regarding the unit of essence as $C_{20}\,H_{16}$, while we regard it as the fourth part, viz., $C_5\,H_4$.

In natural camphor the coupling joint is simply an atom of oxygen.

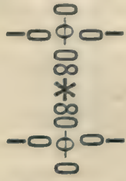
In artificial camphor (terpine, etc.), it is an atom of aqueous matter, such as has been described, which might be called basic moisture—

Camphor.



$\frac{1}{2}(C_{20}H_{16}O_2)$

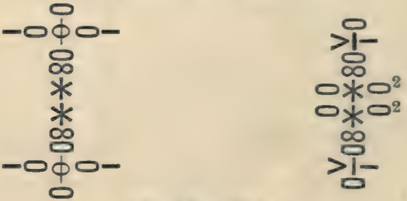
Terpine, etc.



$\frac{1}{2}(C_{20}H_{16}, 4\,HO + 2\,aq)$

And now, making the usual movement from the vegetable to the animal kingdom, let us substitute an atom of aquæform ammonia for the atom of moisture in the centre of the element of artificial camphor or terpine, and we obtain an interesting result, viz., a dimorphous element, whose formula is that of the lately-discovered

Neurine, or Choline.



$C_{10}H_{13}NO_2$

The diagram on the right hand represents the structure when assimilating itself to tissue. And if the carbon be doubled on the body (for which there is just room) it represents it as on the way for generating a colorific merely by oxidation or the discharge of hydrogen, as will soon appear more plainly.

The same translation of the 2 × 3 atoms of carbon from the poles to the equator may possibly take place in reference to the merely aqueous camphor, and the genesis of a colorific equally result.

But all such structures are capable of improvement by doubling, especially this neural and hepatic element, which when doubled gives a dodecatom of the simple hydro-carbon $(CH)_{12} = C_{12}H_{12}$, carrying an atom of that interesting substance aldehyde-ammonia on each pole—

1. Dodecatom of CH, . . $C_{12}H_{12}$
2. Aldehyde-Ammonia, . $C_8\,H_{14}N_2O_4$

1. Choline, ... $C_{20}H_{26}N_2O_4 = 2(C_{10}H_{13}NO_2)$

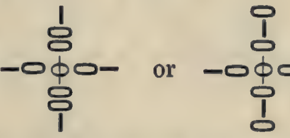
It is never to be forgotten, however, that whether taken as single or double, these structures are only single elements or members of dodecatoms (or possibly of icosatoms) which are the true molecules.

PROTAGON.

And here I am tempted to show that by constructing into a dodecatom these two isomorphous elements, that with the aqueous, and that with the ammoniacal coupling joint—the former as the body, the latter as the poles—of what is at any rate a most exquisitely constructed composite dodecatom, and by placing an atom of phosphorus as the coupling joint between two such structures, we obtain as nearly as could be expected or desired the formula of Liebreich's protagon, his element of the cerebral system. But to press such matters at the present moment is premature. The constructive faculty has not sufficient light to walk safely into the sanctum sanctorum of the temple of the organization. This much has been here mentioned, however, as serving to show the possible value of the liver to the brain, or the drag that it may be on it.

DYSLYSINE AND CHOLIC ACID.

Hitherto we have met with no other products of hepatic action but such as are also produced by vegetation. But from the more vigorous synthetic activity of animal life, and of such a massive organ as the liver, are we not to expect some richer hydro-carbon than the essential oil element, whose minim formula is $C_5 H_4$? Yes; let us suppose that the main part of the hepatic hydro-carbon is the same, but that in the liver the vegetable hydro-carbon receives the usual addition of $C_2 H_2$, that is, CH on each pole. We thus obtain a dimorphous structure for—



The Biliary Hydro-carbon, . . . } or $= C_7 H_6$

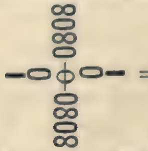
And now let us suppose that structures of this kind attach themselves around a glycogenic atom as a nucleus, the intermediate atom of hydrogen being common to both, we thus obtain at once the formula of

Dyslysine, . . . $C_{12} H_{12} O_{12} + 12(C_7 H_5) = 2(C_{48} H_{36} O_6)$,

that biliary body which survives all others under the ordeal of the laboratory. Nor need we wonder at its so surviving, because in consequence of the dimorphism of the biliary hydro-carbon the dodecatoms may be differentiated in structure, and so rendered stable, while yet they remain isometrical in form. This substance does not, however, like the other dyslysine, more happily named cholesterine, occur elsewhere than in the laboratory.

Nor does it yet occur in nature, even when the polar elements are more fully differentiated by the accession of oxygen substituting hydrogen, so as to constitute them into what might be called—

Tricarbacetic acid,



$$= \left\{\begin{matrix} C_4\,H_4\,O_4 \\ C_8 \end{matrix}\right. = C_7\,H_4\,O_4$$

But we now obtain a dodecatom which presents itself in every case to the chemist, where the more exquisite differentiation of the poles by nature in the construction of the bile-molecules has been destroyed and substituted by moisture or atoms of H and O during the processes of the laboratory. For thus we obtain

$$\begin{array}{l} \text{Cholic, or} \\ \quad\text{Cholalic} \\ \quad\text{acid,} \quad . \end{array} \left\{\begin{array}{ll} \text{The nucleus (sugar),} & C_{12}\,H_{12}\,O_{12} \\ \text{The body } 10(C_7\,H_6), & C_{70}\,H_{60} \\ \text{The poles } \ 2(C_7\,H_4\,O_4), & C_{14}\,H_8\ \ O_8 \\ \hline & C_{96}\,H_{80}\,O_{20} \end{array}\right\} = 2(C_{48}\,H_{40}\,O_{10})$$

And now we reach the bile-acids themselves.

Glycocholic Acid, etc.

The two most eminent biliary molecules, with regard to which there is room for believing that they have not been much altered by chemical processes, are glycocholic and taurocholic acids, or rather, indeed, these when steadied by an atom of sodium in each pole substituting the terminal atoms of hydrogen. These names are meant to be expressive of the fact that, under appropriate chemical treatment, both acids dedouble, the former yielding glycocoll, and the latter taurine, along with cholic acid in both cases. Now, where there is to be glycocoll, nitrogen will be given by combustion. And where there is to be taurine, sulphur also will be given. For these elements, then, we must provide a place in these acids.

Now, directing our attention, in the first instance, to glycocholic acid—which, as occurring in our own species, is the most interesting in a pathological point of view—and assuming that the body of the molecule is that which survives in cholic acid and dyslysine, we have only to determine the structure of the poles; for the poles, no doubt, contain the small quantity of azote which is found on combustion. But shall we suppose that this element exists as azote in a molecule before which there is such a long career of vital action as there is for a particle of bile? Azote is, of all known elements, the most truly residuary and inactive, nay, we might say, excrementitious. Doubtless, when functioning in the living organism, it exists along with its occluded hydrogen as ammonia.

Let us take, then, as the central element in the poles of the glycocholic molecule, an atom of aquæform ammonia.

But ammonia by itself is a vapour, and must be held down and fixed somehow, else it will be off. How, then, shall it be fixed here?

Doubtless, in the same way as aqueous vapour is fixed when occurring, like ammonia, in the living organism; that is, by carbon.

But how shall atoms of carbon apply themselves to our atom of ammonia in the conditions of existence in which bile is generated?

To this the most considerate answer is, that the atoms of carbon may apply themselves in many ways, thus involving occasionally the construction of abnormal as well as normal bile, and consequently a pathological as well as a healthy action of the liver.

But when we consider that the ultimate hydro-carbon, which is at once simple and symmetrical in all the hydro-carbons that we have yet met with, is the essential oil element or marsh gas with its hydro-carbon or hydrogen wings gone (which might be called

Apterous marsh gas), . . .

and that the exterior structure of an atom of aquæform ammonia, (being, as Laurent long ago supposed, a kind of hexagonal prism), is altogether suitable for receiving three such forms as buttresses to its alternate sides, we may meantime suppose that this is the way in which the atom of ammonia is fixed equatorially—an arrangement which appears to exist in the aspartic, and many other vegetable principles.

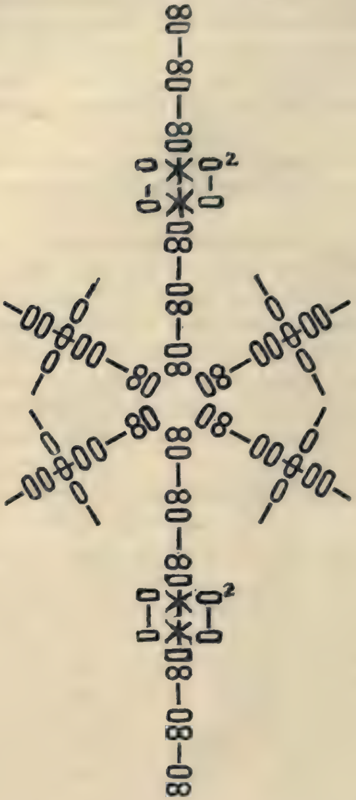
And what as to the poles of this beautiful ammoniacal structure? To this it may be replied at once, that saccharines (CHO), as, indeed, we have seen already, when they cannot construct a dodecatom, ever tend to go in sets of 3, while, at the same time, in every region of vital dissolution followed by reconstruction, saccharine elements are always present. This would give us, as the material of which the poles of the molecule of glycocholic acid are constructed, the remarkable numbers for the two poles—

$$\begin{array}{rl} 2\times2\times3 = 12 \text{ Saccharine elements}, \;.\;\;.\;\;. & C_{12}\,H_{12}\,O_{12} \\ 2 \text{ Hydro-carbo-ammoniacals}, \;. & C_{12}\,H_{12}\,N_2 \end{array}$$

or, leaving the innermost saccharines on the poles to appear as belonging to the saccharine nucleus, and adding an atom of moisture on each pole, we obtain at once—

$$\begin{array}{c} \text{Glyco-} \\ \text{cholic} \\ \text{acid,} \end{array} \left\{ \begin{array}{llllll} \text{The nucleus,} & C_{12} & H_{12} & & O_{12} \\ \text{The body } 10(C_7\,H_5), & C_{70} & H_{50} & & \\ \text{The poles, . . .} & C_{22} & H_{22} & N_2 & O_{10} \\ \text{Two HO, . . .} & & H_2 & & O_2 \\ \hline & C_{104} & H_{86} & N_2 & O_{24} \end{array} \right\} = 2(C_{52}\,H_{43}\,NO_{12})$$

Glycocholic Acid.



2 (C_{52} H_{43} NO_{12})

When this exquisite molecule is reduced by the consolidation of the polar matter, and the reduction of the ammonia to a nitrogen or urea state, it is easy to see that, by the appropriation of moisture, two atoms of glycocholic acid must give two of cholic acid and one of glycocoll in its mature or dodecahedral form (see p. 139).

With regard to taurocholic acid, the principal difference between it and glycocholic is that it carries also an atom of sulphur on each polar member.

There are also other acids of the bile in certain of the lower animals, in which there is a higher charge of carbon than in the human biliary acids when they are normally constructed. Thus, in the corresponding bile-acid of the goose there is C_{12} H_{12} more than in glycocholic acid. And, by unnatural treatment of this bird, it is well known that the quantity of fatty matter in its liver may be increased enormously.

And most probably in ordinary cases in man pathological states of the bile consist in the main in an overcharge of hydro-carbon;

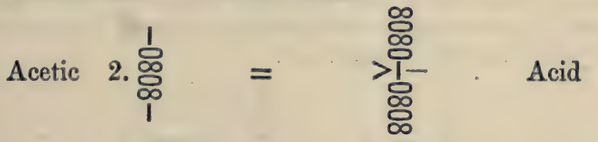
for carbon is the universal sedative entering into the organism, first indeed to protract existence, and to prevent life from being merely ephemeral, but when in excess tending to fix altogether, that is, to kill.

But molecular morphology in its actual state does not enable us to determine for certain the precise order in detail of the elements constituting such a molecule as a biliary body, especially the order of those of the polar members, although almost the whole of the functioning depends on the structure of the poles of a molecule. Since, therefore, we are forbidden to attempt to state the exact difference between normal or healthy and abnormal or unhealthy bile, when both give the same elements on combustion, we need not carry our constructions farther. And with a few words on the tissue elements and colouring matters constructed by the liver, I will bring this memoir to a close.

But before entering on the colorifics, it will be desirable to see our way as to the nature of certain acids which form the polar elements of these colorifics, and which, indeed, are constantly recurring during organic transformations, we mean the acetic and the lactic acids.

THE ACETIC AND LACTIC ACIDS.

Immediately resulting from the solution and disorganization of the saccharine molecule $C_{12} H_{12} O_{12}$ we obtain two acids—the acetic and the lactic—the acetic consuming two, and the lactic three saccharines (that is, atoms of CHO). These are placed on the same axis in both cases, which improves their symmetry so as to render them insulable, and therefore cognisable in the laboratory as separable or separate substances, at least when they have doubled. This doubling is in such cases the usual course of molecular synthesis in the procedure of nature. When, indeed, by so doing a tetratom of hydrogen, as in marsh gas (see the diagram on p. 228), may be constructed as the nucleus or equatorial body, it may be said to be universal. Thus we obtain—



$$2\,(CHO) = C_4 H_4 O_4$$

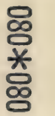
Thus, as the product of the dissolution of an atom of a neutral or inactive sugar, we obtain the equation—

$$1 \text{ Sugar } C_{12} H_{12} O_{12} = 3\ C_4 H_4 O_4 \text{ Acetic acid.}$$

But it is also well known that the saccharine molecule (when its stability is increased by placing it in congenial combination, as when cane sugar is made to unite with lead oxide) may be preserved when its formula reduced to the lowest numbers is $C_{12} H_9 O_9$.

Now we must look whether to such a sucrate there be not a corresponding acetate. And here it appears that by disposing of the moisture with the economy which the smallness of its quantity calls for, we obtain another acetic structure of great beauty, and which, if secluded from moisture, may be of great stability. In this case, for every 4 atoms of carbon there are 3 of moisture. Hence, in order to symmetrical structure, an atom of moisture must be in the centre of the structure. Now, this it can be if the resulting structure is to be a symmetrical form (which a position in the centre demands) not as HO, but only as aq. Into each pole of this central atom of aq, therefore, let the two remaining atoms of HO be inserted by their H poles, and there will be constructed as the equatorial body of the whole structure the beautiful form which we have already met with as the coupling joint of terpine, etc. (see p. 232). And thus in certain acetates we shall have—

Acetate acid

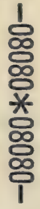


$C_4 H_3 O_3$

Moreover, this acetic form, when in the molecular state, and in the presence of moisture, will doubtless immediately take on an atom of HO on each pole of its 12 members, and thereafter diliquesce and dissolve. Hence, when dried again, the atoms of HO continuing attached, there will be given as before the formula $C_4 H_4 O_4$.

But many cases must occur where the saccharine or hydrate of carbon molecule in suffering dissolution must give the consequent synthesis of saccharine elements not in sets of two, but in sets of three. From this there must result elements in each of which there must be 3C, and when doubled 6C, with more or less of H and O according to the conditions of existence and the particular reaction. Without going over in detail the possible forms of this new aciduous structure, of similar origin, but one step higher than acetic acid, we may here notice that which the constantly recurring molecule $C_{12} H_{10} O_{10}$ must give when all the matter of it is engaged in this new and degraded arrangement.

Lactic acid



$C_6 H_5 O_5$

which, like the other just mentioned, will, when set free in the presence of moisture, and in the molecular state, become moist all over by the incidence of aq on each of its members, thus giving as the formula of each $C_6 H_6 O_6$.

And here I may remark, that this acid is an intensely interesting substance in a physiological and pathological point of view; for our molecular morphology shows that the lactic cylinder COCOC is nearly isomorphous as well as isobaric with an atom of chlorine. Hence there is in the animal frame, especially in the stomach, a play between chlorhydric and lactic acids, which it would be of great importance to understand; for while lactic acid, like chlorhydric acid, seems to be of great value in the stomach at certain times, it is undoubtedly a great evil in the blood and in the system generally.

Tissue and Colorifics.

The economy of Nature appears everywhere to be, first, to provide for THE USEFUL, and when that is fully or more than fully done, to dispose of the surplus as THE BEAUTIFUL.

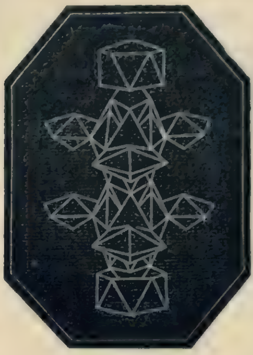
The nascent element, which goes to the construction of tissue, and gives growth of parts, is composed of the same materials, and possesses the same structure as that which imparts the beauty of colour to these parts.

The difference between the two, both being taken in their vernal or nascent forms, consists in this, that in the colorific element the quantity of carbon is much increased — we may say, generally doubled. This appears merely by comparing the respective chemical formulæ, without claiming any insight into the structure of the molecules more than these formulæ impart. Thus the proteine albumenoid, or tissue element, as obtained by C. Schmidt from the muscles of insects, the most perfect of muscular creatures, when reduced to its lower terms (one of the members or radii, 12 of which constitute a dodecatom, or 20 an icosatom, that is, a proteine), when compared with the long-established formula of indigo, the most perfect of colorifics, gives—

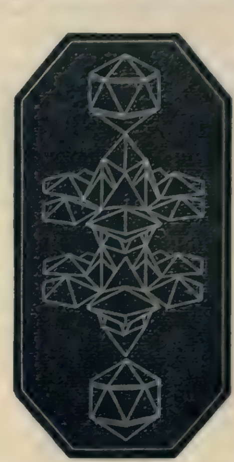
Muscle of insects, .	$C_8 H_5 NO_2 + HO$
Indigo, . . .	$C_{16} H_5 NO_2$.

Unfortunately, it is impossible to give satisfactory diagrams of such molecules as these formulæ represent with types already in the hands of the printer, and on a single plane such as that of this paper. But the following, which give—as white lines on a black ground—the ultimate resultants of the elementary forces, or material elements, may be introduced here. They make an approach, according to our molecular morphology, to the true forms of the molecular elements. That on the left hand represents an element of tissue when first nascent, and fixed by a minimum of carbon atoms (the atom of carbon in each pole being not shown). That on the right hand is the same, now become a colorific element in virtue of its being fixed by a maximum of carbon atoms. The axis in both is an atom of ammonia in its aquæform state, which has six edges or sides; and these in the nascent tissue element on the left carry an atom of carbon on each alternate edge, and in the colorific on the right one on every edge.

A tissue element (nascent).



$C_8 H_5 N O_2$



A colorific element (nascent).

$C_{16} H_5 N O_2$

Now, if on the poles of this colorific element, instead of the remarkable spherule, $\begin{smallmatrix}\circ\\ 8\\ \circ\end{smallmatrix}=C_2O$, we substitute the more lengthened acetic element, $C_2H_2O_2$, and the still more lengthened lactic element $C_3H_2O_2$, we obtain—

$$\left.\begin{array}{ll}\text{1. The colorific body,} & \left.\begin{array}{l}C_{12}\,H_5\,N \\ C_4\;\,H_4\quad O_4\end{array}\right\}+\text{Aq} \\ \text{2. Acetic poles,} \quad . & \overline{C_{16}\,H_9\,N\,O_4\quad+\text{Aq}}\end{array}\right\}\text{Biliverdine.}$$

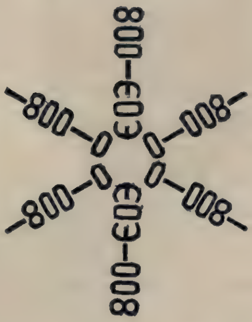
$$\left.\begin{array}{ll}\text{1. The colorific body,} & \left.\begin{array}{l}C_{12}\,H_5\,N \\ C_6\;\,H_4\quad O_4\end{array}\right\}+\text{Aq} \\ \text{2. Lactic poles,} \quad . & \overline{C_{18}\,H_9\,N\,O_4\quad+\text{Aq}}\end{array}\right\}\text{Cholophœine.}$$

These may, however, be regarded rather as the vernal or nascent forms of the colorifics than as their mature and most stable forms. It appears that colorifics may indeed be preserved in these forms by being placed around so as to encase or enamel a metallic dodecatom, to differentiate which a tetratom of the colorific is placed on each pole. By this arrangement there may, for instance, be obtained a colophœite of calcium, the calcium being 6·86 per cent., while, from this or some such combination, Thudicum found 6·91, and Stoedeler 6·5 per cent.

But when left to the course of nature, all such structures tend to double; for by so doing they construct compact dodecatoms, sure to be duly differentiated by the reduction of the carb-ammonia to its carb-azotic state.

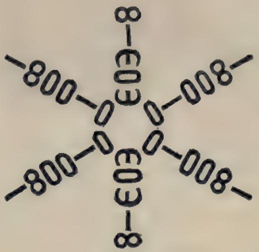
But what the actual arrangement of the successive elements in the constitutive members of the dodecatom from the centre outwards may be in any given conditions of existence, it would be difficult, if not impossible, to determine in the present state of molecular morphology. Taking them in their most fully differentiated forms, however, and as protected from the further attacks of oxygen by having their poles mailed in oxygen already, we obtain such diagrams as these—

$C_{36} H_{22} N_2 O_{12}$



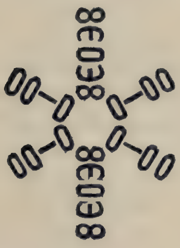
Cholophæine.

$C_{32} H_{22} N_2 O_{12}$



Biliverdine.

$C_{32} H_{10} N_2 O_4$



Indigo.

The great repository of such molecules is coal-tar, which, being the crude destillate of the most stable parts of the magnificent vegetation of a former world, is naturally full of colorifics and fragrant essences.

ARTICLE V.—*Cases of Amputation of the Penis; with Remarks.* By DAVID JOHNSTON, M.D., M.A., L.R.C.S., Surgeon to the Royal Infirmary, Montrose.

(*Read before the Meeting of the Forfarshire Medical Association, held on the 13th July* 1871.)

WHEN looking about me recently, in order to find something in any degree unusual, and not of everyday occurrence, which I might offer to you on this occasion, a patient happened to be under my care in the Infirmary here, in whose case I had performed amputation of the *membrum virile*, on account of malignant disease of that organ; and as in the course of the last eleven years other three instances of the same ailment, in each of which the same proceeding was adopted, have come under my notice, it occurred to me that a short history of the operation, and its results in these cases, might prove not altogether unacceptable to the members of this Association.

Most surgical writers state that cancer of the male organ is not of frequent occurrence. Perhaps it is not, if we take it in relation to the frequency with which this disease invades other parts of the body; but I think the fact, that four instances of this ailment have occurred in the practice of one of us, during a period so comparatively short, proves that it is not so infrequent as some indicate.

I can hardly conceive that any cause, short of the existence of disease of a malignant character, can necessitate this mutilation; and, as in my cases the relief from severe suffering was so decided, and the prolongation of life so unlimited, under circumstances of comparative comfort, even when the prognosis was far from favourable, I have been induced to select this subject for your acceptance to-day.

The first case was admitted into this Infirmary in March 1860. The man was a seaman, in his fifty-fourth year. He had been going to sea until within a short time of his admission, and was in fair general health. The entire glans and prepuce, as well as a considerable part of the body of the organ, were involved in the disease. There was a chain of enlarged glands in each inguinal region, and the man's sufferings were great. After a short trial of the effects of rest and escharotics without the smallest benefit, amputation was performed at the root of the organ by a single stroke of an amputating knife. Three or four vessels were secured by ligature, and a piece of dry lint applied. About two hours after the patient's removal to bed, very considerable hæmorrhage occurred, which was arrested by the application of a saturated solution of alum. In a very few days the glands in the groin began to diminish in size, the wound healed quickly, and in a few weeks the patient left without the least tendency to contraction of the urethra, but with two or three of the glands still enlarged. A week ago—that is, eleven years since the operation—I saw him quite well.

In the summer of 1865, a farm-servant from the neighbouring county, about sixty years of age, consulted me on account of epithelial cancer of the glans penis, which was the occasion of much pain, and prevented him following his usual occupation. His appearance was cachectic, and each groin was studded with enlarged glands. The prepuce and body of the organ were free from disease, and paraphimosis existed. The entire glans was removed in the same manner as in the former case. All the bleeding vessels were carefully sought for and secured; but in two hours I was again summoned, as the patient was faint from loss of blood. A very considerable stream of blood was seen to issue from the preputial orifice, but on exposing the wound only a general oozing could be discovered. A piece of narrow tape was tied tightly round the now flaccid and empty prepuce, with the effect of completely arresting the bleeding. This patient returned home within the week. He had no contraction of the urethra, and passed water freely. When he left, the inguinal glands were already undergoing a process of diminution. Three years afterwards, I was asked to see this man again at home. He was then labouring under a disease of an entirely different nature, of which he died. He was able to tell me that his old ailment had never again threatened him.

A sailor, aged forty-two, was admitted into the Infirmary in December 1870, who had been for almost a year the subject of epithelioma of the prepuce and glans. He had a short time previously been in another hospital, where scissors and escharotics had been used without more than temporary benefit. When removal of the organ was proposed to him, he begged that measures of a nature less severe might first be had recourse to. Accordingly, while under the influence of chloroform, various masses of warty-looking structure, growing from hard broad bases, were removed by scissors, and potassa fusa freely applied. This proceeding appeared to increase the growth of the disease. By-and-by the encroachment of the cancerous mass upon the urethra rendered micturition very difficult, and the glands in the neighbourhood were visibly enlarging. The poor fellow was now anxious that the first proposal should be carried out without delay. This was accordingly done in the same manner as formerly. Every bleeding vessel was secured, but, as happened in each of the previous cases, profuse secondary hæmorrhage took place about two hours after the patient's removal to bed. This was speedily and most effectually arrested by drawing the loose integument well over the bleeding stump, placing it between the blades of a pair of dissecting forceps, close up to their junction, and then tying their points firmly together. The wound healed well, the glands diminished in size, and the man left. As the urethra showed a disposition to contract, a bougie had been regularly introduced for some time previous to his departure.

In the course of the summer he returned, on account of the difficulty he experienced when passing water, having been at work for a couple of months. During his absence he had attempted to dilate the urethra by passing a catheter himself, but he had evidently perforated the canal immediately under the symphysis pubis, the result of which was a considerable abscess. The urethra was freely divided upon a slender director with great benefit. When this patient left, it was doubtful whether, in addition to the urethral narrowing, a malignant deposit had not made its appearance in the situation of the urinary abscess, and helped to embarrass micturition. There was, however, room for hope that inflammatory condensation, the result of this abscess, might be the cause of the hardness, and may yet disappear.

The last case to which I shall solicit your attention is that of a labourer, aged fifty-five, who was admitted into the Infirmary in April of the present year. He also had been in another Infirmary previous to his admission here, when operative interference had been declined. In this instance the prepuce and glans, as well as the body of the organ, were involved. In addition to the chain of moderately-enlarged glands in each groin, there was in the right groin one gland larger than the others, having the skin over it slightly reddened. The entire organ was removed as on the previous occasions, but in this instance the urethral membrane was divided by scissors into four flaps, and each flap stitched by a fine needle and thread to the integuments, in the manner practised by M. Ricord. Ten vessels required ligatures. The wound healed well, without any tendency to contraction of the urethra; and when the patient left, the enlarged glands, even that one with the suspicious blush, were gradually getting less.

Remarks.—Malignant disease of the penis is accounted one of the diseases of advanced life. Amongst the cases I have brought under your notice, there was one occurring at the early age of forty-two, and it is the one which we discharged in the least hopeful condition. The result of the operation in this case induced me to deviate from the plan I had followed previously with so much satisfaction. The mode, however, last adopted seems preferable, as it ensures in a great degree the patency of the urethra, as well as the more speedy cicatrization of the wound.

The operation is an easy one. Professor Syme says, "The penis may be amputated without ceremony." He and most surgeons recommend that the organ be removed by a single stroke of a sharp amputating knife, and that a bougie be introduced occasionally to prevent contraction of the urethra during cicatrization. To obviate this, M. Ricord recommends and practises the plan adopted in the fourth case recorded in this paper.

Dr Watson of Edinburgh practises an operation which—to use his own words—consists in "thrusting a long and narrow bistoury between the corpus spongiosum and the corpora cavernosa near the root of the organ, carrying it forward for about an inch, when the corpus spongiosum and skin corresponding to it are divided by a stroke of the knife downwards, and the amputation completed by the division of the corpora cavernosa on the level where the knife was originally introduced. The skin then, dissected back from the corpus spongiosum, has a longitudinal button-hole made at its base, through which the corpus spongiosum is passed."

It is very generally advanced by surgical authorities that operative interference should not be had recourse to if the glands in the groin are affected. Now, in every one of the cases just narrated, this glandular complication existed in a degree more or less decided, and in all of them the operation was followed by great amelioration of symptoms and was no doubt the means of considerably prolonging the lives of the patients. Epithelioma is almost always the disease which causes a necessity for this special amputation, and every one is aware of the general success which attends removal of this disease in the lip, its most common situation, and the length of time it often exists in the rectum, before a fatal issue takes place, when excitement and irritation are guarded against. One peculiarity of the operation is the tendency to secondary hæmorrhage. In spite of the most careful and prolonged search for bleeding vessels, this occurred in three of the cases.

The object I had in view, in the preparation of this short and imperfect paper, was, if possible, to show that the unfortunate subject of malignant disease of the male organ should not be entirely abandoned, although the glands in his groin are, even in a considerable degree, affected.

ARTICLE VI.—*Case of Ovario-Mania.* By STRETHILL WRIGHT, M.D.; Senior Assistant Physician of the Royal Edinburgh Asylum for the Insane, Morningside.

INSANITY, connected with and dependent upon disorder or disease of the organs contained in the abdominal and pelvic cavities, is characterized by a want of power in the mental manifestations; it is insanity of the asthenic type. Cerebral disorders originating from temporary and curable abdominal disease are of frequent occurrence: they vary in gravity from the peevishness and feeling of incapacity for reflection produced by an attack of indigestion, to cases where the mental impairment is such as to necessitate placing the patient under supervision; thus affording the sane control of others to assist his own depressed and incapable will and judgment.

As an instance of mental disorder arising from such a state of things, and curable in its nature, I may mention the case of a patient who has recently left the Royal Edinburgh Asylum, having entirely recovered capability for the management of his affairs.

Mr B. followed the avocation of a pianoforte-maker, and for some time before his mental powers became impaired he had been very hard-worked; his digestion, under a system of long hours, no rests, and irregular comfortless meals, became entirely disordered. When admitted to the Royal Edinburgh Asylum this patient was in a pitiable state of general nervous and mental prostration, trembling from head to foot, bathed in a cold clammy perspiration, with a countenance expressive of the greatest distress. He could neither eat, sleep, nor think: if he forced himself to swallow, his food lay like a load on his stomach. The treatment of the case consisted in complete rest from physical exertion for a time, fresh air, the procurance of sleep, and the administration of laxatives and nervine tonics.

Van der Kolk gives a most vivid and excellent sketch of this form of insanity, in which he recounts his personal experiences of such an attack of bodily and sequent mental disorder. He ascribes the mental symptoms of such a morbid state to the effects that abdominal disease has in modifying the cerebral circulation, through its influence on the organic plexuses of that cavity. He states that, in his own case, the discharge of a solitary source of irritation—a hard mass of feculent matter from the bowels—*at once* relieved the mental symptom. He also narrates the case of a gentleman, whose melancholy, of several years' duration, was in like manner instantaneously dissipated by the ejection of similar masses from the bowel. In the case of Mr B. the mental disorder was not caused by the presence of an immediately-removable source of irritation, but on a depraved condition of the digestive apparatus. When, however, the stomach recovered its tone, then also the mind returned to its normal condition of sanity.

Such is a hasty sketch of a case where insanity depended upon a curable disordered physical state. In other cases, the originating cause of the mental imperfection is neither curable nor removable, and the cerebral affection dependent on it is permanent. The unhappy patient lives in a constant atmosphere of melancholy, and entertains delusions or fixed impressions of a depressing type, frequently traceable to and closely connected with the seat of organic disease.

To such a case Esquirol refers in his article "Sypemanie," where he speaks of a man who after death was found to have a cancer of the stomach. During life this man was plunged in a profound melancholy, and entertained the delusion that a crab was present in his stomach; he imagined that the suffering he experienced, which rendered his life wretched, was caused by the creature devouring his entrails.

It is of a case of insanity depending upon chronic disease of the female organs of generation to which I would draw attention in this notice.

Marion P. had twice exhibited symptoms of mental disorder, on both of which occasions she was under treatment in the Royal Edinburgh Asylum. The history of her case is shortly as follows :—

Marion P. inherited a tendency to mental derangement, her father and two uncles having been insane. She became insane for the first time at the age of thirty-five. She is reported, in the notes of her case taken at the time, as being naturally of a melancholic temperament, and of an industrious though unsettled disposition. It is said she received an injury of the head some time before this first manifestation of mental derangement, and since then she has been subject to headaches.

Grief at the desertion of her husband was assigned by those who brought her to the Asylum as the cause of her mental disorder. A peculiarity of manner had been noticed for seven weeks before it was thought requisite to place her under proper treatment.

The characteristic of this patient's mental ill health after admission was a great and constant depression. She had hallucination of vision, and imagined that she saw spirits. After being resident in the Asylum for about a month, she suddenly became excited, was restless day and night, especially at night; averred that the spirits were tearing her entrails, to which they gained admission by the vagina, and that persons unknown violated her person during the night. This state of excitement gradually abated, and she was discharged five months after admission, "nothing remaining of her insanity but discontent."

On her second admission her insanity was ascribed to the effects of a disappointment in love; her mind had been slightly affected about a month, but the symptoms of mental disorder had been grave for seven days. Her expression and manner were indicative of great mental depression. She entertained numerous unfounded suspicions of her neighbours, who, as she imagined, accused her of having given birth to a child, which she had murdered. She at this time also had hallucination of hearing. Her general health is described as "below par," her bowels being sluggish and her complexion sallow.

From this state she again rallied; her mind to a certain extent shared in the improvement, and she was again discharged, but very shortly returned to the Asylum, her mental disorder having manifested itself in full force immediately after her removal. From this time till her death this woman was occupied in the sewing-room, where she worked industriously. She lived in an atmosphere of deep gloom, and constantly complained that spirits and other unknown agents tortured her day and night, by thrusting instruments into her womb and having connexion with her.

It is curious that this patient, though her general mental powers were evidently somewhat impaired, would converse sensibly on tôpics of common interest, and was always most respectful in her manner.

She continued in this state for some time; then her digestion became much impaired; she complained of sickness and pain on taking food; she began to vomit whatever she took; the gastric pain became constant and severe. A very foul discharge made its appearance from the vagina; and, on examination, the os uteri was found to be hard and nodulated. She after this became rapidly worse, vomited everything she took, complained of racking pain in the back and loins, and died exhausted from want of nourishment, and the wearing effect of the pain she experienced from the cancerous affection and attacks of sub-acute peritonitis. A curious change took place in the symptoms of her mental disorder towards the close of her illness; she confused persons, and accused every one who came near her of contributing to intensify her sufferings. A post-mortem examination of the body was held the day after death, when it was found that the body generally was well nourished, and there was a proportionately large amount of fat in the abdominal wall.

The thoracic organs were perfectly healthy.

On opening the abdominal cavity, the great omentum was found to be so infiltrated with hard cancer as to present the appearance of a solid cake. The stomach was adherent by its greater curvature to this solidified great omentum; its cavity was reduced to about one-half its normal calibre by puckering of the greater curvature; but no ulceration had taken place in its interior. The parietal peritoneum of the greater omental sac was studded with miliform deposits of a cancerous nature. The peritoneum, forming the mesentery and covering the coils of small intestine, was free from these deposits, but was blackened, and presented the appearance of recent inflammatory action.

The uterus and ovaries were completely solidified by cancerous deposit in their substance. I have endeavoured to represent the appearance of this mass in the annexed sketch. There was no trace of cancer in the ligaments of the uterus or in the vagina.

The other abdominal organs were free from cancer.

The united stomach and omentum weighed 22 oz.

The uterus and ovaries together weighed 19 oz.

The brain was apparently quite healthy; it was small, but the convolutions were numerous and the sulci deep; there was about 2 oz. of clear serum present at the base.

The encephalon weighed 41 oz.

I have been induced to report this case, not that the mental symptoms are of an unusual nature, but because it well exemplifies the relation of cause and effect which the organic disease bears to the mental disorder in such instances.

Did space permit, it would be most interesting to discuss such a case from point to point; here only a short summary can be attempted. In this patient's case, then, a mind hereditarily susceptible of disorder is exposed to severe trials of a moral nature (her husband's desertion), and exhibits symptoms which, as they increase in gravity, even her neighbours recognise as morbid; her manner for some time had been "peculiar" It is impossible to judge how long the malignant disease of the abdominal and pelvic

organs had lasted, but her menstrual function at the time of her first residence in the Asylum was normally discharged.

It was not till after a month's residence that she became excited, and at this period of excitement she for the first time manifested delusions as to the violation and abuse of her person. It is, I think, interesting to find it noted that excitement supervened at this time, as showing that there was an increased action of the circulatory system. Might not this have been coexistent with the commencing cancerous deposit? Under careful treatment in the Asylum her bodily health improved, and she so far regained her mental stability as to be entrusted with her liberty.

On her second admission there was marked impairment of her general health; she had reached the age of 41, and did not menstruate after her admission. She again, under judicious treatment, rallied somewhat, recovered her sane mental capacity to a certain extent, and was discharged; but her health, after removal from the Asylum, at once broke down, and her mental disorder recurred in full force. As her constitution gave way before the inroads of her incurable disease, the symptoms of her secondary or mental disorder depending upon it became intensified; till, towards the very last, she lost all power of judgment, and accused those to whom she had formerly been attached of conniving at and assisting in her torture. In this, as in many cases of all forms of insanity, the manifestation of the disordered mental condition became much exaggerated at night.

The facts to which I would chiefly draw attention, as exemplified in this case, are, that, in many instances, specific disease, by its general effect on the constitutional tone, may so influence the condition of the brain as to produce a state of mind apt passively to receive impressions on the value of which it is unable to adjudicate. The mind, being thus morbidly and unduly impressed, produces insane manifestations.

When the physical disease is incurable, the insanity resulting from it is lasting, and from its nature and seat give form and colour to many of the phenomena displayed by the mind whose disorder depends upon it.

Dr Skae, of the Edinburgh Royal Asylum, is of opinion that chronic diseases of the female reproductive organs are, when connected with mental disorder, accompanied by a sharply-defined class of mental symptoms. To this form of insanity he has, in his classification of mental diseases, given the name of ovario-mania; and the case just narrated is an excellent and well-marked example of this mania in its incurable form.

Part Second.

REVIEWS.

The Medical Jurisprudence of Insanity. By J. H. BALFOUR BROWNE, Esq., Barrister-at-Law. London: 1871. 8vo., pp. 341.

NOBODY who knows anything of insanity will deny that this is a good subject for a book, and that a work upon the subject is much needed. Dr Blandford, in his recently-published "Lectures on Insanity and its Treatment," has two useful chapters instructing medical men how to examine patients, make out certificates, and perform what might be required of them under the Lunacy Acts. But the subject is too wide and too full of perplexing questions to be discussed in two lectures. Dr Blandford's book is the production of a medical man, will not be readily understood save by medical men, and takes what may be called the medical or pathological view of insanity. Mr Balfour Browne tries to occupy a middle ground. His work is designed both for the lawyer and the physician. He hopes that it "will do something to explain, and therefore to reconcile, the differences which too frequently arise between these in cases in which civil capacity or criminal responsibility is in question."

The son of the well-known Dr W. A. F. Browne, late Commissioner in Lunacy for Scotland, and the brother of the Medical Superintendent of one of the largest Asylums in England, the author has had unusual opportunities for making himself acquainted with the symptoms and nature of insanity, and some of his remarks show a considerable acquaintance with pathology in general. The notes and references at the foot of the volume indicate a wide study of the literature of insanity, while the author's knowledge of the legal bearings of the subject seem to be both thorough and extensive. Throughout the work the author gives evidence of a vigorous and cultivated mind, gifted with a correct judgment and much speculative acuteness. His style is lively, full of metaphor and quaint illustrations, but occasionally abrupt, and often diffuse. Like a young soldier armed with a breechloader firing ten times in the minute, in his eagerness to display his marksmanship, he wastes his ammunition upon this and that object, and encumbers himself with the spoils of the slain, instead of pressing on to pursue the survivors. An author's ammunition is his words, which he should try and use in a brief and telling manner; nor ought he to indulge in digressions merely because some happy idea has occurred to him which has a more or less distant association with the subject of his writing. Nevertheless, the book is pleasant reading; and no one can peruse it without acquiring a great deal of useful knowledge on the subject of which it treats, and exercising his mind on a great many problems similar to those he will meet with, if he has to do with insanity either as a lawyer or as a physician. To test a book of this kind one must consult it as well as read it; and we have looked for and found in Mr Browne's chapters advice which would, at one or other time, have helped us in bygone perplexities, and which will be useful to those that go after us in similar straits.

It is well known that there are long-standing differences of opinion between medical men and jurists upon the responsibility and civil capacity of the insane; and we agree with Mr Browne in thinking that the doctors have often made use of their knowledge in attempts to establish impracticable refinements. The lawyers, on the other hand, are apt to ignore pathological facts, and to trust entirely to observed symptoms. At the same time they have a much keener sense of what is necessary and fitting in order to make the machinery of law and society keep on working. As Mr Browne points out again and again, nothing is more delusive than to endeavour to dole out absolute justice to the case of every individual. It is this dream that is the cause of so many wild theories and discontented attacks upon the existing social order of things. It seems to us that many people in their tenderness to the insane altogether forget that the interest of the sane is a much more important matter. From a literal and pedantic adherence to the principle of non-restraint, they will allow an ungovernable maniac to tear up clothes enough to clothe half the inmates of the asylum, rather than put him at once in a strait-jacket. Some medical men would have all the eccentric and weak-minded people in the country under a lunacy certificate, and cover half the crimes that go before our law courts under the plea of moral insanity.

The Lord Justice-Clerk Inglis said—"Disease of the brain is not insanity. Disease of the brain is bodily disease, and insanity is mental disease, and no amount of bodily disease will justify you in pronouncing the persons insane." It would be easy to show how apt such assertions are to mislead a jury; but medical men are too prone to forget that very extensive disease of the brain may exist without the patient being either of unsound mind or free from legal or moral responsibility.

"To say," Mr Browne argues, "that in no case of insanity will the fear of punishment or the hope of reward deter the criminally-disposed lunatic from committing a crime, is to say what is denied by the experience of every director and superintendent of the insane throughout this country, who are in the daily habit of enforcing a code of discipline with the view of maintaining internal order in the establishment under their control; and to assert what no one in this country who has the least knowledge of the subject will believe, viz., that mental unsoundness is incompatible with crime. Indeed, cases come every day under the cognizance of those who have to do with the insane, in which the criminal act is entirely beyond the sphere and influence of the reigning delusion, and accordingly, in so far as that delusion is concerned, the product of a sound mind."

In discussing the legal relations of dementia, Mr Browne remarks —"Whenever the simple connexion between the act, and the punishment as a consequence of the act, ceases to be appreciable to the mind of the individual, all infliction of punishment should be done away with. But that there should be any hesitation about punishing a man because he is insane, if he understood that the act he committed was criminal, that it was forbidden, that it was punishable, and if he was able to refrain from its commission if he chose, seems to us an utterly unreasonable demand; and we believe that a man may labour under dementia in its first stage, and still know all these things, and have the power to refrain from any criminal act, and may, notwithstanding, commit an act which is criminal. In such a case the insanity is an accident to the crime—not an attribute. When it is the latter only, ought it to stand in bar of punishment?"

Mr Browne deals with the question of moral insanity in a very able manner. "If, however," he remarks, "our ideas of right and wrong are formed in connexion with the ideas of reward or punishment—if our dislike and disparagement of certain actions, and our approbation and praise of other actions, is founded on our belief that in the one case the individual committing the action should be punished, and that in the other case he should not, it is evident that our moral distinctions have an intellectual origin, and that any such phrases as moral sense, or conscience, as distinguished from ordinary intellectual function, are apt to deceive, and any distinction between moral and intellectual insanity is unphilosophical. This is not the place to consider whether this is a true statement of the fact or not." It has often struck us that many of those who argue for moral insanity being recognised as an excuse for crime and a bar to punishment, have never brought any theory of morals to maturity, or have actually committed themselves to the theory of the utilitarian, where, as Mr Browne remarks, moral actions cannot be separated from intellectual processes. Even granting that men's actions are necessarily determined by antecedent motives, the law has a right to introduce the threat of punishment as a motive to turn men away from actions injurious to the community; and where the threat fails, the punishment may at least deter others from similar offences.

Mr Browne, at the end of the chapter, makes a guarded admission of moral insanity, and we are half inclined to think he has granted too much. "Here we would," he says, "while we praise the caution of our courts of law in hesitating to recognise moral insanity, and point out that, from the rarity of cases in which this disease is unaccompanied by very prominent intellectual symptoms, very little injustice has been done in consequence of the law's unwillingness to recognise this kind of insanity,—censure the dogged persistence of lawyers, who will not, even in the present state of medical psychology, and with the amount of evidence which has been accumulated, admit that there can or ought to be a recognition of such a form of disease by our criminal law."

Mr Browne occasionally descends in a trenchant manner upon the fine-spun conceits of "alienist" physicians. "Many wise men have argued that under certain circumstances a man is entitled in mere self-defence to kill himself. Hume, Rousseau, Madame de Staël, Montesquieu, Montaigne, Gibbon, and Voltaire have all endeavoured to show that circumstances might justify suicide; and one writer, Robert of Normandy, surnamed the Devil, not only wrote in praise of it, but, knowing how much more powerful example was than precept, actually killed himself! Many men of much nobility have committed suicide; and Isocrates, Demosthenes, Cato, Lycurgus, Codrus, and a great many more, have tried to get into the next world by a sort of private entrance. But although philosophers and lawgivers once thought that suicide was not to be condemned, and imagined that circumstances might arise under which it would be the most rational course to pursue, in the present day we are informed emphatically that 'suicide is not the act of a healthy mind,' and are assured that in all cases suicide is a proof of the existence of insanity. So Sir J. Romilly, Lord Castlereagh, Cotton, and Chatterton were all mad according to recent medico-psychologists." So far has this notion been carried, that it was argued, in a recent number of the *Journal of Mental Science*, that life insurance companies ought not any more to refuse the payment of policies to the heirs of suicides.

One can scarcely expect that a book of this kind, entering up to so many difficult questions, should be wrought into such perfection as to be proof against all censure; but, in our opinion, if the author could have avoided digressions, he had left few faults for the critic to fasten upon. Mr Browne has no more need to give us a chapter on the causes of insanity than a lawyer writing a digest of statute law to give a chapter on the causes of crime. If he had in any way cleared up those causes, we should have welcomed his chapter; but this is too much to expect from a young barrister, however brilliantly gifted.

We do not want to be told that drunkenness, or phthisis, or want, or undue religious excitement, are causes of mental derangement. What we want to know is the manner and conditions under which they become causes: for it is clear that millions of people are addicted to drunkenness and religious excitement, and suffer from poverty, or from phthisis, or from both, sometimes from all those evils combined, and yet do not become mad. It is not a sufficiently precise statement that a man is shot because he goes under fire; the real explanation is, that he occupied space which was traversed at the same time by a bullet. The fountain Arethusa may have come from the Alpheus, but what we would like to know is, how it managed to get under the sea from Arcadia to Sicily.

Mr Browne, who talks with some contempt on the present "extraordinary desire for the education of all," naturally thinks very little of the attempts to educate imbeciles.

"One thing," he tells us, "has to be pointed out with reference to the educational improvement of which imbeciles are capable, and that is, that almost all the education which can be bestowed does improve, but tends only to make the imbecile more mischievous and troublesome. Their extra training seems only to teach them how more cunningly to perpetrate their vicious acts. It rather tends to make them more vicious. The reason of this is obvious. The education cannot be carried far enough to establish in the individual any good principles of morals. So, while the intellect has slightly improved, the moral nature is still undeveloped."

One would think that Mr Browne had some special knowledge on this subject which he was anxious to communicate at the expense of straying from his subject, though it is perfectly clear he has not mastered the preliminary details. Writing of idiots, he remarks, "Only in the rarest cases is the head of full size and well formed." Had he examined the heads of a large number of idiots, he would never have made so incorrect a generalization. No doubt, a very small cranium must ever be accompanied by idiocy, but those who imagine that idiots or imbeciles have generally skulls of the Neanderthal pattern have not drawn this notion from a proper study of the subject. We have measured and examined all the heads of the inmates of the Larbert Institution, and a good many elsewhere, and whatever may be the causes of idiocy, we can aver that microcephalic idiots are not common, and that the heads of idiots are not often misshapen, whatever may be the lesions within the external coverings.

Education has the same effect upon imbeciles as upon beings of higher intelligence; it increases their means of doing evil as of doing good, but it enables them to see more clearly the unhappy consequences of wrong-doing,—it calls their moral faculties as well as their physical powers into healthy exercise, and brings them more under the authority of their teachers and guardians, even when it cannot reach high enough to put them in dread of the statute-book. It weans them from the disgusting habits into which, if neglected, they are sure to fall, and in a great variety of ways increases their power both of self-control and self-help. As Dr S. G. Howe well puts it, speaking of the Pennsylvania Training School for Feeble-minded Children, "it has shown that idiots form no exception to the law, that every form of organized life is capable of being changed for better or worse by surrounding influences."

It is singular that a man of Mr Browne's culture should talk of some pathological observations being a confirmation of the theories of the phrenologists. Whether there is any truth in Broca's view, that aphasia is due to a lesion in a certain part of the left side of the brain, is far from being settled; but scientific men at present no more dispute about the truth of phrenology, as taught by Gall and Spurzheim, than they do about the vortices or phlogiston.

In conclusion, we wish success to Mr Browne's book. It is deserving of praise both from its ability and its completeness. It will be of service both to the physician and the lawyer; and from the lively way in which it is written, and the judicious selection of interesting cases with which it is illustrated, it will be read with no less pleasure than profit.

Thirteenth Annual Report of the General Board of Commissioners in Lunacy for Scotland. Edinburgh: T. and A. Constable: 1871.

We have seldom had so pleasant a task committed to us as the perusal of this blue-book for review. The Scottish Lunacy Reports have, year by year, emerged from the trammels in which the Commissioners originally bound them, and we now look upon them as becoming every year more valuable contributions to the general history of this part of the kingdom. With the means at the disposal of the Commissioners we should have reason to complain if they did not; but public officers do not always make the best use of their opportunities, and frequently look upon their places as conveniences for dignified laziness, or at best for busy idleness. No one, after reading the very interesting report before us, can say this of the Scottish Commissioners in Lunacy; there is rather matter for surprise that, after the naïve confession of the difficulty, from want of statutory powers, they have in procuring the information they want—the wonder, we say, is that they can do so much. They do not forget that the very essence of the commission under which they serve is, that they shall provide proper accommodation for lunatics, whether asylum or otherwise, and they approach this inquiry in a philosophical spirit, as little fettered by prejudice or biassed by a sense of power as can be reasonably expected from mortal man. Accordingly, we are presented with an interesting and trustworthy account, not only of the condition of the extensive lunatic asylums which have been erected all over the country, and which, from the character, as a general rule, of the medical men who superintend them, may be taken greatly upon trust; but we also have most valuable and thoughtful information on the state of lunacy generally throughout this kingdom.

On the 1st of January 1869, there were 7310 lunatics in Scotland, of all degrees and both sexes, exclusive of those maintained at home by their friends, of whom the Commissioners have no official cognizance, and whose numbers they estimate roughly at 2000. On the 1st of January 1870, there were, by the same method of calculation, 7571 lunatics. This statement, showing an increase as it does of 261 in one year, would be alarming enough of itself; but when taken in connexion with the fact, as shown by a table in the Report, that since 1858 the numbers have increased by 1664 lunatics, exclusive of the inmates of idiot schools, or at the rate of about 150 per annum, it deserves to be the theme of careful research. The Report does not enter on the delicate question of the increase of lunacy, but says that the augmented numbers may be attributed either to the growth of lunacy, or to an increased demand for proper accommodation for lunatics already in existence. Our space does not allow us to follow the Report through all the tables by which it argues out its suggestions and conclusions, and we shall therefore consider those conclusions without any more reference to statistics than is necessary to make ourselves understood.

As the greater number of the 2000 lunatics of whom the Board have no official knowledge belong to the classes little removed from pauperism, it is only reasonable to expect that they will gradually be officially known to the Board, as their friends become unable to maintain them. And thus we have an unpleasantly convenient reserve fund of lunacy, upon which we shall have to draw for many years to come, at the average rate of 150 per annum. The taking of efficient prospective measures for the relief and accommodation of these people is one of the gravest social questions of the day, and it is most surprising that it has attracted so little attention. Large asylums of the most modern type have been built all over the country, able physicians have been appointed to superintend them, no expense has been spared, and still the cry is, "They come, they come!" It is hard to say what is to be done. After all the enormous outlay, it cannot be said that these splendid appliances have done much in the way of arresting the increase of lunacy; and if year after year we are to be told that there is an average increase of 150 officially reported lunatics, *plus* this reserve fund of 2000, we shall soon listen with willing ears to any proposal for disposing of them. We hope we shall not be misunderstood. We do not mean that large district asylums are a mistake. No one who has paid any attention to the subject, who has even taken the trouble to read the first Report, with the Appendix, published, we think, in 1856, by the Scottish Commissioners, would venture to say that. But the evil of the matter lies in this, that the superintendents of these district asylums are too prone to consider their establishments as the centre-pieces round which all other appliances are to be grouped as mere auxiliaries. If they were hospitals for curable cases only, the view would be a correct one, but the mass of the lunatics in them is composed of cases, in all important features, the same as those which are provided for elsewhere. The fact is, that these district asylums, on the principle on which they are at present managed, are themselves only part of one great scheme, and only entitled to more important consideration because they have a larger number of inmates than small licensed houses. And all schemes for making them the centre of a lunatic colony are mere playing with the subject. The views of the Board of Lunacy on the matter are so entirely in accordance with our own, that we give their words :—

"The obstacle which appears to have hitherto most stood in the way of effect being given to the provisions of the statute for the removal from asylums of patients who have so far recovered as to be harmless, is a feeling entertained by the medical superintendents that a certain amount of responsibility would attach to them for recommending or permitting the removal of such patients; and accordingly some of them, while fully admitting that many inmates of their asylums do not require the special appliances of such institutions for their proper care and treatment, are averse to their removal from their own supervision. But we have already shown that in the cases of private patients, removal from the supervision of the asylum superintendent is a matter of comparatively ordinary occurrence, without, to say the least, the obtrusion of any evil results; and we can see no reason for expecting a different effect in the cases of pauper patients. It has been suggested that the patients whose detention in the asylum has ceased to be necessary, should be removed to villages or cottages in the neighbourhood of the institution, where they might still be under the supervision of the superintendent. But under the existing statutes this scheme is incapable of realization. It has to be kept in view that the asylum superintendent is the servant of the District Lunacy Board, and that the functions of that Board are restricted to the erection of asylums, and to the proper care and management of the patients placed in them. They are not responsible for the treatment of patients placed elsewhere, and, although they might appoint district inspectors to report on the condition of the asylums within their district, they could not delegate to the asylum superintendent, nor even to such inspectors, authority to take charge of patients in private dwellings, seeing that no such authority is vested in themselves. Besides, under a scheme of this kind, many of the patients would necessarily be at a distance from their homes, beyond the reach of their friends, and still under rules and regulations scarcely less irksome than those of an asylum. We can see little advantage, either to the ratepayers or to the patients, from such a scheme; while we would fear that the condition of the inmates of the asylum would materially suffer, from the divided duties of the superintendent, which it would involve. We shall have occasion to show in a later portion of this Report, how persistent must be the supervision of an asylum to guard against accidents, and how many of a serious character take place, even under a system which demands the whole time and attention of the superintendent. Besides, we think it highly improbable that the legislature would consent to alter the present statutory provisions, seeing in how great a degree their object has hitherto been disregarded."—Pp. vii., viii.

If these views are correct, and all experience and expediency say they are, it is plain we must look to other quarters for help.

The quarter to which the Commissioners point is the establishment of a more recognised system than holds at present, of distributing the harmless chronic insane amongst their own homes, under the care of trustworthy guardians, who shall be in their turn under the supervision of the Board of Lunacy, in the person, we believe, of the Deputy Commissioners. This system, which is in a great measure peculiar to the Scottish Lunacy Board, is of the utmost practical importance, and one which has, under the able direction of the Board, assumed large proportions, as a valuable and now, we may say, indispensable part of the working of the Lunacy Acts. At the same time, it is a system which requires to be most jealously watched, and to be enlarged only by the most gradual steps. The supervision exercised by the Deputy Commissioners is not, from the fact of there being only two, sufficient for an extensive scale of operations, and we wonder that they have been able to do so much. To work the thing properly, there should be at least two more appointed. We make this suggestion because we are this year deprived, in the Report, of the interesting accounts of what has been termed the "Cottage System," which have in former years been one of the most readable portions of the blue-book. This omission is due to the Deputy Commissioners not having had time to overtake their work.

In the beginning of this article we spoke of the naïve confession of the want of statutory powers by the Board. This is apparent in many parts of the Report. In one part they say that "the difficulty in procuring accurate returns from inspectors of poor, prevents us from bringing down the general statistics of lunacy to a later date than the 1st of January 1870;" and in another, they allude to the difficulty of obtaining any returns at all from asylums. We make the following extract from the Report:—

"In previous reports we have stated that there are many points of statistical interest, embracing, among others, the civil condition of the patients, their occupations, their ages at the period of attack, the causes and forms of their mental affections, the duration of the malady at the date of admission, and the intervals between successive attacks, which we would gladly have brought under review had the materials at our command been sufficient for the purpose. But we thought it better to abstain from any such attempt, than to make statements that rest on no sufficient basis. It may be well, however, to illustrate by some examples, the imperfect nature of the data for statistical purposes which are supplied to us from asylums, and on which alone our conclusions could be founded. Materials which would illustrate the causes, progress, and termination of the various forms of insanity, are possibly to be found in asylum registers and case-books; but such materials do not of necessity come under our observation; and besides, they could only be safely made available by the asylum officers who had had the cases under their care. There are some points, nevertheless, on which we might throw some light without much risk of serious error; as, for instance, on the number of epileptics, of patients affected with general paralysis, or of patients labouring under certain other forms of nervous disease; or on the comparative ages of patients in different asylums. But even this information we could obtain only by special returns from each asylum, and by the courtesy of the asylum officers, who are not required, by statute, to furnish it. We gladly take this opportunity of acknowledging the readiness with which applications made by us for non-statutory returns have been met by asylum superintendents; but we have a natural hesitation in making calls upon them which must occupy a good share of their time, and more or less seriously interfere with their own special duties."

As an instance of the difficulty which the Commissioners experience, let us cite the following case:—A patient was twice admitted into an asylum on the following terms:—" On the first admission the first medical certificate indicated mania, the second indicated melancholia, and the medical report diagnosed dementia. Then in a few months the patient is discharged recovered. On her second admission, the first medical certificate indicates mania, the second, dementia or idiocy, while the medical report diagnoses moral insanity. It would be extremely difficult, if not impossible, to decide from these materials under what form of insanity the patient should be classified."—P. xxi.

Now, it is quite possible that the six certificates which are alluded to above were all accurate descriptions of the condition of the patient on the occasion of each examination, indeed the first three might happen any day, but we think the case is rather an argument for better opportunities for the proper study of insanity than for increased powers to the Board of Lunacy. However, it is an unseemly sight to see such respectable gentlemen as those who form the Board scampering over the country after refractory inspectors of poor, and sending round the hat for asylum statistics.

We have already passed the ordinary limits of a review of a blue-book, but let the great interest which the Commissioners in Lunacy contrive to infuse into theirs be our excuse. They give on every page such evidence of keeping themselves *en rapport* with the freshest opinions of the day, that our difficulty is to select where all is so good. For instance, in a few sentences on insanity itself, how neatly they epitomize the labours of the last ten years!—" There is," they say, " no such disease as insanity. There are various affections of which unsound mind is a symptom, but the removal of such mental unsoundness must be dependent on the restoration of the healthy functions of the organs on which it depends." This is an admirable summary of the prevailing theory of the day, of which Dr Skae was the originator. The only objection to the theory itself is, that while Dr Skae has had several able disciples, there have been not a few who have ridden it to death, and have brought it into some disrepute.

We should have gone with great pleasure into the discussions which the Board raises on the subject of the habitual drunkard and criminal lunacy, but we have already exceeded our proper limits. Suffice it to say, that the article on the former subject is carefully written, and shows extensive experience of the insane at large and in private dwellings, while the remarks on the latter are open to question in several particulars, on which we should have been delighted to break a lance, had our space permitted.

A System of Surgery, Theoretical and Practical, in Treatises by various Authors. Edited by T. HOLMES, M.A. Cantab., etc. Second edition, in five volumes. With illustrations. Vol. V.:—Diseases of Genital Organs, of Breast, Thyroid Gland, and Skin; Operative Surgery; Appendix of Miscellaneous Subjects; with a General Alphabetical Index and List of Authors. Pp. 1131. London: Longmans, Green, and Co. 1871.

THE first part of this volume to which every reader will turn, is the completion of the article on the Process of Inflammation, by Dr Burdon-Sanderson, which was begun in the first volume by Mr Simon.

The immense changes in the views of the pathology of this process due to the labours of pathologists (chiefly German) in the last ten years necessitated a complete revision of the subject, while it placed a vast number of strange and new pathological experiments before the view of any one wishing to be familiar with the most recent investigations. Dr Sanderson endeavours, with considerable success, to place before English surgeons a succinct account of the more important of these experiments, and also, perhaps less successfully, to give them an idea of how far these results are to be accepted either as destructive of former views, or as materials of a new philosophy.

The purpose of the article is to describe the effects of injurious irritation of tissues under two heads. 1. Disorders of the circulation; changes having their seat in the bloodvessels. 2. Alterations of tissues. The improvements in experimenting, the mesentery of a *curarized* frog being substituted for the web of an undrugged one, have changed some of the views formerly held as to whether dilatation or contraction of an artery is the first morbid change. Increased knowledge of the innervation of the vascular system has established the doctrine that all vascular nerves pass through the ganglionic nervous system. The experiments of Ludwig and Lovén give the important result "that all arteries manifest alternating states of contraction and dilatation, their rhythmical movements being entirely independent of those of the heart and of breathing, and ceasing when the vessel is paralyzed by division of its nerves. These experiments are briefly related. Excitation of the central end of a divided sciatic causes acceleration of the circulation. This has been proved by Stricker and Riegel by beautiful experiments, in which they compare the current in a given artery with a current through a tube fixed on the eye-piece of a microscope, the velocity of which current is known, and can be varied at pleasure. However, our increased knowledge of innervation of bloodvessels is still too imperfect to enable us to harmonize facts.

The varying effects of certain familiar irritants on the circulation are then noticed—the effects of ammonia being still remarkable and inexplicable.

Exudation of liquor sanguinis and *leucocytes* are next considered. Credit is given to Dr C. J. B. Williams, to Dr Addison, and specially to a less-known man, Dr Augustus Waller, for having so long ago as 1846, under many disadvantages, anticipated, to a great degree, the now famous investigations of Cohnheim, on the subject of white corpuscles or lymph corpuscles, or (as Dr Sanderson now prefers to call them) leucocytes, and their wanderings through the coats of the smaller bloodvessels.

The natural history of the gigantic amœbæ, Plasmodia, of the Myxomycetes, and of Cienkowski Vampyrella, show that they possess motion and growth, along with a considerable power of absorption, and leads up to a description of the remarkable observations of Recklinghausen, which commence a new era in histology, by showing that the leucocytes resemble amœbæ in having individual movements, absorptive powers, and locomotory habits. The enormous patience necessary for the discovering and demonstration of these facts is shown in the following description of the process:—

"The vein, in an inflamed part, is observed to have its wall lined with a continuous pavement of leucocytes nearly motionless. The eye must now be fixed on the outer contour of the vessel, from which here and there minute colourless button-shaped elevations spring, just as if produced by budding out of the wall of the vessel itself. These buds increase gradually and slowly in size until each assumes the form of a hemispherical projection corresponding to a leucocyte. Eventually the hemisphere is converted into a pear-shaped body, the stalk end of which is still attached to the surface of the vein, while the round part projects freely. Gradually the little mass of protoplasm removes itself further and further away, and, as it does so, begins to shoot out delicate prongs of transparent protoplasm from its surface, in nowise differing in their aspect from the slender thread by which it is still moored to the vessel. Finally, the thread is severed and the process is complete; the observer has before him an emigrant leucocyte."—Pp. 752-3.

But our space forbids prolixity; so we must hasten on. Under the head of "Stasis," the remarkable experiments of Ryneck of Gratz show that the presence of blood is not necessary, for he has shown that all the phenomena of stasis can be produced by irritation in the webs of frogs, in which milk, or the defibrinated blood of mammalia, has been substituted for the circulating fluid.

Under the head of "Structural Changes in the Capillaries," Stricker has shown that they are not merely passive tubes, but contractile, and also exhibit remarkable powers of union with each other in wounds by outgrowths and budding; also that probably they have the power of reunion after separation, as if no severing had taken place.

To the second part, regarding the changes which take place in the tissues, we can only allude very briefly, and must refer to the original accounts of the researches of Cohnheim and Recklinghausen, Stricker, and Norris. These are put in a simple form before the English reader, and illustrated by excellent woodcuts.

The following are his conclusions:—

"1. In every inflammation which attains its full development, the changes which manifest themselves in the inflamed part are of three kinds, distinguished from each other according to the organs which are concerned in their production. They are either (1) effects of disorder of the vascular nerves and centre; (2) effects of alteration of the properties of the living walls of the capillaries; or (3) effects of the stimulation of the living cells by transudation of liquor sanguinis.

"2. Of these three orders of phenomena, the second only can be regarded as absolutely essential to the existence of inflammation, which may, therefore, in the strictest sense, be said to have its seat in and about the veins and capillaries, it being there that the earliest and most constant effects of irritation or injury manifest themselves.

"3. The nervous and vascular effects of local irritation cannot be directly described as successive stages of one process; for the determination of blood to the seat of injury, which is the sole result, and, if I may so speak, purpose of the vaso-motor disturbance, has no relation to the local vascular changes, excepting in so far as it tends to make the exudation more abundant. Exudation of liquor sanguinis, although favoured by increased arterial afflux, may occur without it, and, as a rule, continues after the afflux has ceased. The vascular and textural changes, on the contrary, may be regarded as successive stages of one process, for they are connected by a causal relation—the exudation of liquor sanguinis, in which the former ends, being the determining cause of the latter.

"4. The mode in which an injury changes the living substance of the vascular walls so as to make them permeable to the blood is unknown. The nature of the change itself is also unknown; the only clue which we have to its character being that afforded by the structural alterations to which it leads in certain organs, and particularly by those which are observed when the process of separation, attended with the formation of new capillaries, is commencing. From these appearances we are led to infer that the primary change consists in the transition of the material from the formed to the plastic condition—from a state in which it is resistent, because inactive, to one in which it is more living, and therefore more labile.

"5. In all living tissues the effect of inflammation manifests itself in a modification of the action and properties of individual cells. In cells which form part of permanent structures, the protoplasm increases in quantity, and becomes more or less contractile. Subsequently it is converted entirely or partly into young cells, either by cleavage or by endogenous germination."

The article concludes with a few noble paragraphs by Simon on the destructive effects of inflammation, which appeared in the first edition.

We have left no room to discuss in detail the other articles in this volume, most of which are amplifications of those in the original editions. Professor Lister has given a full account of the most recent plans of using his antiseptic precautions in his article on Amputation. More than 160 woodcuts greatly increase the value of this edition, and the publishers' and editor's duties have as before been admirably performed.

The Diseases of Children. By FLEETWOOD CHURCHILL, M.D. Dub. and Ed., M.R.I.A.; and FLEETWOOD CHURCHILL, Jun., F.K. & Q.C.P., etc. Third edition. Dublin: Fannin and Co.: 1870. Pp. 900.

On Some Disorders of the Nervous System in Childhood. By CHARLES WEST, F.R.C.P., etc. London: Longmans, Green, and Co.: 1871. Pp. 136.

THE latter of the two works whose titles we have quoted above, constituted the Lumleian lectures delivered at the Royal College of Physicians of London in March of this year, and therefore comes before us with somewhat higher pretensions to authority than the unpretending manual of the Messrs Churchill. These Lumleian lectures were founded by Richard Caldwell, Doctor of Medicine, and John, Lord Lumley, who, in 1572, executed a joint deed laying a perpetual rent-charge on their lands for the foundation of these lectures. Little is known of Caldwell beyond the facts recorded that he was examined, approved and admitted into the Royal College of Physicians, and appointed Censor, all in one day, being also chosen one of the Elects in less than six weeks afterwards. He was of middle age when he joined the College, and was already in failing health when his benefaction was bestowed, for in the same year he was specially excused on that score from attending the meetings of the College, and two years afterwards he died. Lord Lumley, however, survived his friend nearly forty years, not dying till 1609. The character recorded of him by Camden is, "that he was a person of entire virtue, integrity, and innocence; and in his old age a complete pattern of true nobility." In his earlier years, however, his nobility was not so marked, for we find him first intriguing to rescue our Scottish Queen and place her on Elizabeth's throne, and afterwards we find him on the commission for the trial of her whom he had pledged his knightly word to serve; and we subsequently meet with his name in connexion with some of Elizabeth's worst judicial tyrannies. Peace to his ashes! Lumley and Caldwell's joint lectureship was that in which a greater than either—William

Harvey—first brought before the profession his great discovery of the circulation of the blood. For the sake of the benefits he has indirectly brought us, we as a profession may surely be to Lumley's faults political a little blind. Dr West's lectures are not likely to exert such an important influence on the progress of medicine as Harvey's, but the influence which they will assuredly exert will certainly tend to the advancement of medicine in its application to the diseases of childhood; and we have no hesitation in saying this in spite of the fact, that in the only disease in regard to which he has entered somewhat fully into treatment—chorea—we dissent from the principles laid down, and feel bound to warn most strongly against the use of a remedy which Dr West recommends most highly—tartar emetic. In childhood this is always a hazardous remedy. Dr West himself states that it must be employed with caution, yet he has not hesitated to push it to the amount of nine grains in the day. Dr West adds, that he is not acquainted with any death which could be fairly attributed to the antimony, though his saying so exhibits his own misgivings, which we confess we share, while he also adds that he has seen at least one death following its use, from apparently causeless exhaustion. And this feeling we do not share; for fatal exhaustion following such doses of antimony in a child could scarcely, we think, be justly called causeless, though no vomiting or purging were present, and though the finger should fail to detect any change in the pulse up to the moment of commencing death. Gillette's tartar emetic treatment we regard as scarcely less dangerous than Trousseau's strychnia treatment. Tartar emetic is, besides, not known to act as a special sedative of the nervous or muscular systems, though its secondary effects on both are sometimes sufficiently alarming; and even in those cases of chorea in which "the movements seem to constitute the disease, and in which there is no special indication to guide us," we should certainly try not tartar emetic, which is dangerous, nor henbane, conium, or belladonna, which are useless, but Indian hemp, or specially the Calabar bean and chloral —the first of which has occasionally proved useful; the second, which has been frequently so, and has, moreover, an undoubted effect on the nervous system; while the latter has not only proved curative in itself when given freely in full doses, but also invariably produces sleep and rest from the distressing movements, thus, at the worst, giving time for the action of other remedies, among which we may give a prominent place to arsenic, the use of which is not even alluded to by Dr West, in spite of the commendations bestowed on it by the late Dr Begbie, who states that he invariably found its employment successful—a commendation which has been joined in by other men of large experience, and in which we ourselves agree.

Dr West regrets that he has been forced into a speciality; but when that speciality consists in the treatment of the diseases of by far the larger, and for many reasons the more interesting, part of the human race, regret seems to us by no means the right word to employ—rejoice would seem more suitable from every point of view. And we certainly rejoice to find that Dr West reveals in almost every page proofs that his large experience has been duly cultivated. In almost every page we find exhibited that intimate acquaintance with child-life, and the influence of disease upon its bodily and mental manifestations, which, to our thinking, is somewhat rare, and could only be acquired by a philosophic generalization based on extensive experience. Dr West's language is perhaps slightly more poetical than we are accustomed to in medical treatises; but this is excusable under the circumstances in which the work was produced; and, while not detracting from the truthfulness of its descriptions, it adds greatly to its general attractiveness. Where all is so interesting it is perhaps invidious to particularize his remarks on the various forms of infantile paralysis, on loss of speech in childhood from various causes, and on the mental peculiarities of chilhood—all of which reveal the hand of a master.

As a sample of the beauty and truthfulness of Dr West's writing we may give the following quotation, which embodies much that we ought never to forget, and, in a few words having relation to childhood, contains principles applicable to all ages:—“ No one can have watched the sick-bed of a child without remarking the almost unvarying patience with which its illness is borne, and the extremity of peril from which, apparently in consequence of that patience, a complete recovery takes place. Much, indeed, is no doubt due to the activity of the reparative powers in early life, but much also to the unruffled quiet of the mind. No sorrow for the past; no gloomy foreboding of the future; no remorse, disappointment, nor anxiety depresses the spirits and enfeebles the vital powers. The prospect of death, even when its approach is realized—and this is not so rare as some may imagine—brings in general but small alarm. This may be from the vagueness of the child's ideas; it may be, as the poet says, that in his short life's journey ‘the heaven that lies about us in our infancy’ has been so much with him that he recognises more clearly than we can do

‘The glories he hath known,
And that imperial palace whence he came.’

I dwell on this truth, because it is of great practical moment that we should bear in mind to how very large an extent the child lives only in the present; because it follows from it that to keep the sick child happy, to remove from it all avoidable causes of alarm, of suffering, of discomfort—to modify our treatment so as to escape a possible struggle with its waywardness; and even if death seems likely to occur, to look at it from a child's point of view, not from that which our larger understanding of good and evil suggests to our mind,—are duties of the gravest kind, which weigh on the physician, on the parent, on the nurse, and which it behoves us none the less to remember because they are not dwelt on in the lecture-room or in the medical treatise.

"One word, and but one, I would add here, and I trust I may do so without incurring the suspicion of want of respect for religion, or of want of faith in its doctrines. Some of the most painful death-beds I have ever witnessed have been those of children whose over-anxious friends have striven to force upon their minds the deepest verities of our faith, in that definite form in which they are embodied in catechisms and formularies. It is easier to frighten than to console; the dark grave is realized, or at least imagined, more vividly than its Conqueror; and the little child, driven to look within for the evil which it does not know, and cannot find, but vaguely dreads, and would be sorry for if it knew it, has moved me to compassion only less than that I felt for its broken-hearted torturers, who have failed to learn that the little children—of whom our Saviour said that of such was His kingdom—were not called on to recite any creed, to profess any faith; but, just as they were, in their helpless ignorance, were deemed fit to be folded in His embrace, and to be held up to us as our example." With these sentiments so beautifully stated, we beg to express our entire concurrence, and to point out that they have been partially, though not inaptly, forestalled by the late Miss Adelaide Procter in describing a mother with her dying child:—

"Nay, his very mother's pain,
And the mighty love within her,
Could not give him health again.

So she knelt there still beside him,
She alone with strength to smile,
Promising that he should suffer
No more in a little while,
Murmuring tender song and story
Weary hours to beguile.

Suddenly an unseen presence
Checked those constant moaning cries,
Stilled the little heart's quick fluttering—
Raised those blue and wondering eyes."

We are too apt to forget that even the inevitable and recognised approach of

"That shadow cloaked from head to foot,
Which keeps the keys of all the creeds,"

does not absolve us from the discharge of our final duty to our patient—to promote his euthanasia. It is even more difficult to conduct our patient gently to the brink of Jordan than to cure him, when that is possible, yet it is not the least important part of our duty to him. However interesting, the subject is too wide and too important to be entered on more at large here, but one phase of it may be aptly shown in the faint reply of the dying Lincolnshire boor to the clergyman who was pressing on his attention certain doctrines which have presented difficulties to cleverer heads under more favourable circumstances :—" Wat wi' faath, and wat wi' the earth a turning round the sun, and wat wi' the railroads a fuzzin and a whizzin, I'm clean muddled, stonied, and bet."

As the Manual of the Messrs Churchill has already reached its third edition, it may be regarded as beyond the pale of criticism, and we can only say that we trust it has been more often bought than read, and more often read than acted upon. Bloodletting, leeching, and calomel, which are on almost every page recommended for almost all the ills to which the flesh of childhood is heir, are not quite the remedies most recommended by the authorities of the profession in this latter half of the nineteenth century. Neither Sydenham nor Latham are authorities to be implicitly trusted, in this respect at least; and in a work upon the treatment of any class of diseases we require something more nowadays than a mere *rechauffé* of the opinions of others. An author who lays down principles may not be always a safe guide, but he appeals to faculties which are capable of correcting his errors, while one who plunges us amid a quagmire of so-called authorities without a clue to guide us in the right direction, cannot but be a most dangerous guide to the young and inexperienced; and as it is chiefly those who appeal to a manual such as the one before us, it is only our duty to warn them that, in regard to treatment at least, it is quite half a century behind the age.

On Bone-setting (so-called), and its Relation to the Treatment of Joints crippled by Injury, Rheumatism, Inflammation, etc. By WHARTON P. HOOD, M.D., M.R.C.S. London and New York: Macmillan and Co.: 1871. Fcap. 8vo, pp. 156.

DR HOOD has, by the publication of this little volume (which first appeared in the columns of the *Lancet*), conferred a very great boon on the profession. With the exception of Sir James Paget's lecture on the cases that bone-setters cure, published some years ago, scarcely anything will be found in professional literature regarding the subject, which, though unpleasant and sometimes unsavoury, is one of considerable importance. For, making the fullest possible allowance for quackery, lies, imposture, and the imagination of patients, it cannot be denied that there are cases in which the manipulations of uneducated bone-setters have done good in cases where surgeons had failed to cure.

Dr Hood has had special opportunities of knowing what bone-setters think they do, and how they do it; and in this volume he gives the *modus operandi*, and a theory of his own, which he thinks, and we believe rightly, is capable of explaining the fortunate results in many cases, and of giving a reasonable anatomical explanation of these results. To obtain good out of things evil, to separate grains of wheat from chaff, is a good and worthy object, and we think well attained in this instance.

The chief pathological phenomenon described is the formation of abnormal adhesions between articular surfaces or in ligaments. Movements make these tense, and cause pain, which is generally referred to one particular point. On this the bone-setter fixes his attention, and during his manipulations presses on this point with great strength. While doing so, he by various twisting movements of the joint puts the muscles off their guard, and then, by sudden and forced flexion or extension, ruptures the new adhesion or false ligament. This operation is generally attended by a crack or snap. This, he says, is the dislocated "small bone" going into its place; but the patient is really relieved, accepts the explanation, which any educated man knows to be false, goes off, and brags of his cure. So the bone-setter's fame spreads, and surgery is at a discount.

Some very striking and interesting accounts of such cases by the patients themselves lend interest to the book, which is nicely written. We have no doubt that it will do good not only to patients but to surgeons.

A Manual of Practical Therapeutics, considered chiefly with reference to Articles of the Materia Medica. By EDWARD JOHN WARING, M.D., F.L.S., etc. Third edition. London: J. and A. Churchill: 1871. Pp. 875.

THIS work was originally published in 1854, and compiled, as the preface to the first edition states, at Mergui, a small isolated station in the Tenasserim provinces, where works of reference could only with difficulty be procured, often requiring to be specially imported from Europe; and it forms a lasting memorial of the author's patient perseverance and painstaking accuracy, as well as an encouragement to others to carry out with diligence whatever they may undertake, recognising difficulties only as obstacles to be overcome, assured that they shall certainly reap their reward. This third edition has been considerably modified—the articles on antimony, calomel, and bloodletting now occupying much less space than formerly, while chloral, apomorphia, bromide of mercury, and other new remedies have been introduced, and larger notice taken of bromide of potassium, Calabar bean, carbolic and sulphurous acid, and such other medicines as, though not strictly new, have yet in recent times acquired novel applications or increased importance as thereapeutic agents; while articles on the hypodermic and endermic methods of treatment have also been added. This work is not intended for students; it does not pretend to teach the science of therapeutics either generally or specially in regard to any given disease; it is simply a work of reference for the practitioner, who, when baffled in his treatment of any case, can, by consulting its pages, discover at a glance what other methods of cure have been adopted by others. A work of this nature has no pretensions to scientific eminence; but it may occasionally prove more useful than any more strictly scientific work. It commences with a short account of therapeutics—of the modes of ascertaining the therapeutic virtues of drugs; and this is followed by a notice of the art of prescribing, with an account of all the circumstances capable of modifying the action of remedies, their best mode of administration, etc. Then follow in alphabetical order all the various articles of the materia medica, with a short notice of all the special uses which have been made of each article, the name of the individual who has thus employed the drug, and a reference to his original paper. In the second part a more extended account is given of various medicinal agents and appliances—as anæsthetics, electricity, acupuncture, etc.; and the work is concluded by a copious index of diseases, under each head being placed the various drugs and appliances which have been employed in its treatment—those deemed most worthy of confidence being distinguished by an asterisk. It is obvious that a work such as this must be used with what Opie mixed his colours—"brains;" but with this proviso we commend it to our brethren.

The Student's Guide to Medical Diagnosis. By SAMUEL FENWICK, M.D., F.R.C.P., etc. Second edition, revised and enlarged. London: J. and A. Churchill: 1871. Pp. 236.

THIS little work is intended, as its title implies, mainly for the use of students, and it seems very well calculated to give a beginner a rough idea of the chief points to be attended to in making, or attempting to make, his diagnosis. An examination in clinical medicine being now generally required, books such as the present are in much demand, and probably none of the many such published is more suitable for a student's use than this one. At the same time it does not deal with any of the difficulties of diagnosis, and is, therefore, not so suitable for a practitioner as others we could name. *Even* for a student's use, we were about to say—but perhaps the word *specially* would be more applicable—there is a want of precision about some of the statements, which may lead to mistakes. Thus, in testing for sugar in the urine, the author tells you to add a few drops of a dilute solution of sulphate of copper, without specifying the strength or the number of drops, and then to add half as much liquor potassæ. In examining practically we have seen many mistakes made from this want of precision; and we think it would be better to say—to one drachm of urine in a test tube add one drop of a saturated solution of sulphate of copper and an equal quantity of liquor potassæ, when the precipitate whch falls at first is immediately re-dissolved, the solution acquiring a brilliant blue colour, which is quite as good a sign of the presence of sugar as the reddish-brown precipitate which falls on boiling—this bright blue colour being never seen except when sugar is present, and the proportions mentioned being quite precise and certain to ensure the accurate attainment of the end desired. Also, we think, it would be well to warn against the fallacy of the yellow coloration occurring on boiling when the urine contains only an excess of uric acid and no sugar, and to point out that this fallacy, so commonly observed in diabetics on a strict meat diet, may be avoided by the use of the test in the cold, no change then taking place from the presence of uric acid, while sugar acts just as powerfully, though not so rapidly, as a reducing agent. Or if time be of moment, then, in such cases, Böttcher's bismuth test ought to be adopted, which, in the absence of albumen, is thoroughly reliable. A stencil plate would also be a great improvement on the carbon paper, as the pattern diagram soon gets worn out; but we much prefer lithographed diagrams, which can be gummed on the back and stuck into the note-book when required.

Our Baths and Wells: The Mineral Waters of the British Islands, with a List of Sea-Bathing Places. By JOHN MACPHERSON, M.D., etc. London and New York: Macmillan and Co: 1871. Pp. 206.

IT is now seventeen years since Dr Macpherson, in his treatise on the Mineral Waters of India, first exhibited his leaning towards balneology. Since then his "Baths and Wells of Europe" have made his name well known throughout this country as an authority in this matter; and the little work we have now to do with will not decrease his reputation in this respect. It is pleasantly and lucidly written; contains in small compass the essence of what we require to know in regard to the springs most in use, besides a great deal of interesting antiquarian information in regard to them. It is no bookmaker's production, but one written for love of the subject and a desire to supply a want very generally felt; and this it does very efficiently. There is, so far as we know, no other work which gives a general survey of all the springs and bathing-places of Britain; these have been only too much neglected for the more numerous and generally more powerful ones of the Continent. And yet this, we think, is a great mistake. Some of the Continental springs are, no doubt, unrivalled, but for others we have no mean substitutes here; while for an invalid we believe the advantage to be derived from a residence in the comparatively equable summer temperature of these islands is far preferable to exposure to the broiling temperature of many of the German spas during the fashionable period. During autumn the line of greatest health in Europe passes through the Highlands of Scotland, as in winter it skirts the Mediterranean; and if in the latter season it is an advantage to send our invalids south, it may come also to be considered an equal advantage for southern invalids to summer with us, especially if we can offer them any advantages in the shape of spas. Most of our British mineral waters are, however, too little known; and all are so wretchedly supplied with all that makes an invalid life comfortable or tends to renovate it, that any work which directs general attention to the subject ought to be welcomed, and every effort ought to be made to improve their natural advantages. In the whole of Britain there is not such a thing as an efficient douche-bath or a man capable of applying it. In all Edinburgh and its neighbourhood—the very cynosure of all eyes for beauty—we have no efficiently-supplied bathing establishment. We can, indeed, learn to swim at Pitt Street at the risk of swallowing lots of the essence of ragged schools, or get a hot salt-water bath at Trinity or Seafield; but there is little comfort or convenience at either place, and a good douche is simply unknown, though much wanted. Quite recently an admirable chalybeate spring—a carbonate of iron—has been discovered at Moffat, which is quite equal in strength and pleasantness to any European spring, while the situation is unrivalled for healthfulness and beauty. Let us hope that every endeavour will be made to utilize this spa and to make it an attraction to our own and even to foreign invalids. A spring equal to Spa, and almost equal to Schwalbach, in the immediate vicinity of Abbotsford and Dryburgh, and in the healthiest part of all Europe in the summer, ought to be a fortune to its possessors. We are, however, progressing. There are now bathing-machines, not only at North Berwick, but even at Leven—a place too insignificant to be noticed by our author, and which yet possesses many attractions. It has a beautiful beach, a good supply of excellent water; it is well drained, and has good links for golfing, besides being in the neighbourhood of many interesting objects—among others, the Wemyss Caves, with their very remarkable aboriginal carvings, to which Sir James Simpson has directed attention. We doubt if the epithets, "quiet and comfortable," are exactly applicable to Portobello, now that it has got its pier; but its vicinity to Edinburgh and beautiful beach will always make it attractive. We cordially commend this book to our readers as likely to be useful; and we hope that our author will soon have occasion to give us a new edition, which, we trust, will be much enlarged, as full and precise information on our own springs and health-resorts is very much wanted, and directing attention to them is the best way of getting them improved.

Handbook of Dental Anatomy and Surgery, for the Use of Students and Practitioners. By JOHN SMITH, M.D., F.R.S.E., F.R.C.S.E. Second edition. London: J. and A. Churchill: 1871. Pp. 176.

THIS little work has already been favourably reviewed in our pages (Feb. 1865, p. 736). To what we have there said there is little to be added, except to say that the present edition is an improvement on the former one, being brought quite up to date, while it has an additional chapter on the principles involved in the mechanism and use of artificial teeth, which renders it somewhat more complete as a treatise on dental surgery. The diseases and accidents which happen to our teeth, and the best modes of repairing them, are matters continually forced upon the attention of the youngest of us by the necessities of our fellow-men, while advancing age brings the matter more directly home to almost all of us. The principles involved in the extraction of teeth, and the disorders of dentition, are also subjects of the utmost importance, concerning which a practical knowledge is daily required, more or less, from us all, and especially from such of us as are engaged in the arduous toils of country practice. We know of no work better suited to convey useful information upon these points, while the chapter on the use of anæsthetics in dental surgery is specially instructive.

Camp Life as seen by a Civilian: A Personal Narrative. By GEORGE BUCHANAN, A.M., M.D. Glasgow: James Maclehose: 1871. Pp. 298.

Parisiana: The Real Truth about the Bombardment, etc. By CAMERON STUART MACDOWALL, L.R.C.P. Ed., M.R.C.S., etc. London: Provost and Co.: 1871. Pp. 141.

RECENTLY we have supped full of the horrors of war, and the remarkable events of the past year have paled even the glories of the Crimea, and helped to obliterate the recollection of all that was disastrous in that memorable campaign. And yet those of us who remember that stirring time can never forget that period of intense anxiety when, next to God, all our hope was in the French. We were then mercifully preserved from that disastrous fate which has recently overtaken our gallant allies; but our loss was sufficiently great, and our mourning for our fallen heroes widespread enough, to enable us to sympathize deeply with our neighbours, who have been, in recent times, still more severely tried. The memory of these times has still a halo of interest around it; and Dr Buchanan's diary, though a little out of date, still contains much that is of interest to the mere general reader, and even some things to be pondered over by those more immediately concerned with the wellbeing of our armies. Since the days of Waterloo there has been no more eventful period of British history than the Crimean campaign; and though our author's connexion with that campaign was but limited in point of time, he, with the eyes of an outsider, saw many things which escaped the ken of those more immediately engaged. "Camp Life" is pleasantly written, and is well fitted to wile away an hour or two of country leisure in these *dolce-far-niente* days.—"Parisiana" is written in a different style. All is stir and action, and the spasmodic sentences have a force in them to which we are somewhat unaccustomed. Yet, strange to say, all the horrors of the first siege of Paris by the Prussians, in which Macdowall so well played his part, have, in their turn, paled before the tenfold horrors of the *Commune* and the second siege of Paris by the French themselves, with its horrible culmination in incendiarism and assassination. So rapidly is history written, or rather lived, nowadays, that Buchanan's "Camp Life," though fifteen years old, is hardly more out of date than Macdowall's "Parisiana," though that is not yet six months old, and the ink with which it was written may be figuratively said to be hardly dry. "Parisiana" is, nevertheless, a most interesting record of the Prussian siege of Paris, while the mild egotism conspicuous on every page helps to lighten up the misery, the gloomy darkness of which is only too conspicuous.

Part Third.

MEETINGS OF SOCIETIES.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXX.—MEETING XV.

Wednesday, 28*th June* 1871.—Dr Bell, *President*, in the Chair.

I. CASE OF HYDATIGINOUS OVUM.

Dr Rattray exhibited A SPECIMEN OF A LARGE HYDATID MASS, which had been expelled after the administration of ergot in drachm doses. Three doses were given with an interval of half-an-hour between each dose.

The patient, a lady of 33, has had three children. Dr Rattray was called in on 26th June, and found her pale, anæmic, and greatly reduced from hæmorrhage.

The case was rather difficult of diagnosis, but was treated as a threatened miscarriage by gtt. vi. tinct. cannabis Indicæ, thrice daily, and cold water enemata. On 27th, severe and labour-like pains supervened, and in a short time a large mass of hydatids was expelled, and what appeared to be part of a placenta remained adherent to the uterus. The patient became very weak through loss of blood; and, taking a serious view of the case, her husband, at my request, soon brought Dr Keiller to my assistance. He removed the adherent mass, she having been previously put thoroughly under the influence of chloroform. Recovery was speedy and good.

Four things are worthy of mention regarding this case:—

1. The patient considered herself four and a half months advanced in pregnancy.

2. She noticed that there existed a greater enlargement of the abdomen at the same period of gestation than in any of her former pregnancies.

3. Sickness continued both day and night for fully three months; whereas, in previous pregnancies, vomiting commenced as soon as she became *enceinte*, and continued for the first month, but only during the day.

4. In addition to severe headaches, she felt for several weeks as if a great oppression or weight had been laid on the top of the head.

Dr Keiller said that when he saw Dr Rattray's patient, she was in a dangerous state. He examined under chloroform in usual position, the hips well over the edge of bed, one hand making pressure over the uterus, the other introduced into the vagina, so as to get two fingers into uterus. He found a mass, which he removed by separating it from the uterus in three portions. There was little hæmorrhage when the degenerated structure was removed. He thought it very injudicious to leave any portion of placenta, if it can be helped, and alluded to the difference of cases in abortion. In natural abortion the ovum is dead, and nature expels the mass. In criminal cases the parts are comparatively normal, and take time to separate, and from this reason he considered criminal abortion was so frequently injurious.

Dr Cochrane concurred in Dr Keiller's remarks on danger of retention of placenta.

Dr Bell said such cases are sometimes attended with all the bad consequences of labour at the full time. He alluded to a case in which the patient fevered and died after the expulsion of hydatid mass.

II. CASE OF RETAINED PLACENTA.

Dr Keiller exhibited A PLACENTA which had been left in the uterus for some days, after what should have been the termination of a case. The patient was attended by a student, who said she had aborted, but hæmorrhage still continued. The woman, when Dr Keiller saw her, looked as if she was dying. He introduced his hand in the same way as in last case, although he thought she was past recovery. He found the mass projecting from the cervix uteri, and removed it. Ergotine had previously been injected under the skin to check hæmorrhage. Brandy and ergot by mouth were subsequently given. She rallied and did well. He does not remember having seen a woman so far gone from hæmorrhage, she being pulseless, recover. He alluded to another case, in which he suspected abortion had been attempted. The placenta was not expelled at the time, and she took pyæmia and died. Had the placenta been removed at the proper time, he thought she might have recovered. He also made remarks on other cases illustrative of the subject.

III. CASE OF CEPHALOTRIPSY. By *Dr Keiller*. To be alluded to at next meeting. Dr Keiller also alluded to another case, in which, when extracting a putrid child, the head was left in the uterus. It was extracted by the cephalotribe with great difficulty.

IV. ON THE USE OF THE CONSTANT CURRENT ON PAINS OF PELVIC ORIGIN. BY DR STEPHENSON.

(This paper will appear in a future number of the Journal.)

Dr Keiller thought the paper one of extreme interest, and referred to the attention paid by our Continental brethren to the application of the constant current. We used electricity spasmodically, which was objectionable. What Dr Stephenson recommended was its too continuous application. Dr Keiller suggested that a committee be appointed to investigate and report.

Dr Gordon thought the reason why electricity had not succeeded in this country was, that we used the interrupted and not the continuous current. He thought Dr Stephenson's observation very important.

Dr Stephenson, in reply, said that a great point in applying the current was to send it through the affected nerve. What is wanted for success is a current of low tension and large quantity; and said he would be happy to treat any cases under supervision of medical attendant, at his own house, without fee, and to give any of the Fellows any information he could regarding this method of treatment.

Dr Gordon thought no further evidence was necessary of the good effects of the remedy, after hearing the case narrated by Dr Stephenson.

Part Fourth.

PERISCOPE.

TREATMENT OF HIP-JOINT DISEASE, by LEWIS A. SAYRE, M.D.—We subjoin, for the benefit of those of our readers who have not seen the original lecture,[1] the following abstract of its chief points of interest. We cannot abstract its vigour and enthusiasm.

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[1] British Medical Journal, 22d July 1871.

In a brief introduction, he gave his views on the *anatomy* of cartilage, alluding to its low vitality, carried on by attachment and absorption; its tendency to disintegration and death; also to the low vitality of the ligamentum teres. He believes that the disease may commence either in the synovial membrane or the ligaments, or in the network of bloodvessels directly beneath the cartilage of incrustation. The *pathological changes* are as follows:—

1. Synovial inflammation, followed by effusion—this being generally the result of exposure to over-exercise or sudden change of temperature.

2. Wrenches or tears of the ligamentum teres—nearly always followed by a destructive inflammation of the bones of the joint. The smaller the amount of the tear, the greater the ultimate danger, as it is less attended to.

3. Concussion or blow producing a blood-blister or extravasation into the delicate network of vessels immediately below the cartilage. If this is at once detected, and rest insisted on, no harm need follow. Even an extravasation under the skin, which, if let alone, will soon get well, will turn into a sore if constantly irritated.

These three varieties of cause have certain differences in symptoms in early stages. Thus: *effusion* is always accompanied by a peculiar distortion—the result of the unfolding of the capsule of the joint, especially the ilio-femoral ligament. The distortion is, the limb is flexed, abducted, and rotated outwards; in later stages even fixed, as if moulded in plaster-of-Paris. The next change in every inflamed joint is atrophy of muscles above and below, with reflex irritation and consequent muscular contraction, and pressure of the joint surfaces against each other. Thus, in diseased hips, the muscles flex the limb, and would adduct, did not the capsular distention prevent it; hence, adductor muscles are found intensely contracted and tight. This is shown by the following experiment. If you take a dead body and flex the joints so as to break up the rigor-mortis, and place it on the back, so that both limbs are in their natural position; if you now bore a small hole through the ilium into the acetabulum, and forcibly inject a small amount of quicksilver, it will cause the limb to flex, abduct, and rotate outwards at the hip-joint. By driving into the hole a small piece of wood to retain this increased fluid within the joint, you will find it impossible to extend, adduct, and rotate the foot inwards without rupturing the capsule; and the attempt to do so, if the capsule do not rupture, will force out your plug like a pellet from a popgun.

It is the struggle between irritated muscles and distended capsule that causes the pain in the *second stage* of the disease—the night spasms being caused by the muscles asserting their power whenever released from the control of the will by the patient's dropping asleep; and exhaustion of vitality ensues from the constant necessity for watchfulness. To relieve this pain you may cut the tendon, or tap the distended joint: nature relieves it by ulceration and consequent rupture of the capsule; but while the child is relieved, the disease has only progressed. The *third stage* is now reached, of effusion into the cellular tissue. A marked change in the attitude now takes place, adduction, inversion of the toes, and apparent shortening of the limb. Then, later on, come the changes in the head and acetabulum, which are not those of luxation as generally described, but absorption both of the head and acetabulum, and slipping upwards of the capsular ligament, which, however, still embraces the head of the femur.

So much for pathological changes; next as to causes. The great error is to regard it as a local manifestation of a dyscrasia or blood disease connected with scrofula or tubercle. It is a *local* disease. Out of several hundred cases observed, and whose history has been traced, 90 per cent. have been in robust, healthy, wild, harum-scarum children. Delicate children take care not to be hurt. Often a very slight injury is the foundation of the mischief, from it not being attended to.

In examining the child, remove every stitch of its clothes. In the diseased side you find the gluteo-femoral fold of nates a little dropped down; the toe turns out, the knee and hip bend; and to careful measurement the affected thigh is already smaller. You then lay the child perfectly flat on a table. If normal, lines from sternum to symphysis pubis, and from one anterior superior spine to another, cross at a right angle, and both popliteal spaces can touch the table. If diseased, and in the stage of effusion, the one leg would be flexed, rotated outwards, and *ab*ducted; if the capsule has been ruptured, the diseased leg has been *ad*ducted, and is inside the central line. Moderate steady extension of the thigh on the pelvis prevents pain on movement; so that you can see that the joint is not anchylosed. While, on taking off the extension and allowing the muscles to contract, you at once reduce pain and produce a state of artificial watchful anchylosis. If the limb be handled properly, and slight extension made, the child can be moved without giving her pain; but the instant extension is taken off, the anchylosis again begins. Pressure causes absorption both of head of bone and acetabulum; absorption will result either in abscess or anchylosis. Artificial extension is the proper treatment. For ordinary night extension by splint or weight, the plaster is to be applied from the ankle to a little above the knee, on both sides of the affected limb. The plaster should be put on without being heated, and very carefully arranged so as not to be puckered, and then fixed by a roller with a stirrup of webbing, to which the buckle for the extension is to be fastened.

For day extension, an instrument consisting of vertical steel rods playing one within the other, and fixed by a key at the requisite level, makes extension from the lower end of the thigh to the crest of the ilium; a perineal pad is attached to the portion of the instrument pressing on the crest of the ilium, so that the patient rests his weight not on the hip but on the perineum.

The advantage of this plan is that the joint can be moved, anchylosis is prevented, and yet pain is removed. Many months may be required for the treatment, and if rest is persevered in all this time, the ligaments previously unaffected may become diseased as a result of the rest. If the disease has gone on to abscess and sinuses, resection of the joint is necessary. The only thing special in Dr Sayre's resection is, that he saves the periosteum as much as possible, and removes the bone freely.

DIGITALIS, ITS USE AND ACTION.—In the Hastings Prize Essay for 1870, which has just been awarded to Dr J. Milner Fothergill, the author has entered somewhat fully into the mode of action and uses of digitalis, especially as applicable to the treatment of cardiac disease. By experiment on fishes, birds, and frogs, Fothergill found that the action of digitalis was to produce firm contraction of the ventricle, which ultimately arrested circulation, and produced death. Similar results have been obtained in mammals by Handfield Jones and Fuller. On contrasting the action of aconite with that of digitalis, it was found that while digitalis produced fatal contraction, aconite produced fatal dilatation; and that when the one was employed as an antidote to the other, aconite had little dilating effect on the heart contracted by digitalis, but digitalis had a powerful and well-marked effect on a heart almost brought to a standstill by the poisonous dilating action of aconite. Belladonna was found to have a somewhat similiar effect, producing marked contraction of the heart; caffein acted also similarly, but in a less degree than belladonna; while strychnine seemed to have no action whatever on the heart, of frogs at least.

The motor power of the heart is under the control of the minute cardiac ganglia, each with a morsel of muscular fibre under its charge. These are alone capable of carrying on the action of the heart, but only in a tumultuous and irregular manner; but these irregular contractions are co-ordinated into a uniform peristaltic movement by the influence of the vagus (Von Bezold). This vagus influence may also be regarded as inhibitory; thus, in the normal condition, it only delays contraction till a sufficient amount of distention is obtained to permit the contraction to go on uniformly; but when this action is anormally increased by any stimulus, such as electricity, cardiac contraction is retarded, and if the stimulus be powerful enough, may be arrested in a fatal diastole.

Besides these, we have also two other nerves, the accelerator and depressor of Cyon, Claude Bernard, and others, which also play important parts in relation to various forms of cardiac disease, but which seem to have little connexion with the action of digitalis.

Traube supposed that digitalis acted on the heart by paralyzing the pneumogastric nerve; but besides other objections to this theory, section of the vagus—and the most complete paralysis could not be more effective than section—only produces death slowly by hepatization and disorganization of the lungs, but digitalis kills by arresting the heart's action primarily. On the other hand, Dybbowsky, Pellican, Handfield Jones, Fuller, and others have regarded digitalis as acting as a stimulus on the cardiac ganglia, and thus producing increased muscular action; and this theory is adopted by Fothergill, who enters into the arguments *pro* and *con*. Further, digitalis acts not only on the heart, but also stimulates to contraction the muscular fibres of the small arteries, thus producing increased arterial tension. It follows from this view of the action of digitalis that there results from its use—

1*st*, Increased and more perfect contraction of the heart generally, mainly of its ventricles.

2*d*, Increased distention and tension of the arterial system.

3*d*, Increased arterial recoil; producing—

4*th*, Increased or improved coronary circulation; and thus—

5*th*, Improved nutrition of the heart; which results in—

6*th*, Compensatory hypertrophy.

7*th*, In connexion with these results, we have to consider their probable effects on atheroma and fatty degeneration of the heart.

From these facts it follows, that in all cardiac affections the use of digitalis is indicated in all cases where the action of the heart is weakened, but not where it is augmented. Even in hypertrophy, however, its use is not contra-indicated whenever pain, palpitation, or other symptoms reveal the fact of over-taxation; but smaller doses are usually required, and by these small doses the desired result is obtained. It must not be employed on any idea of its tranquillizing action being in its nature allied to that of a narcotic or sedative —the opium of the heart, as it has been termed; it is only by enabling the heart to act without laboured effort that it calms excitement. In all valvular affections, digitalis is useful or useless, entirely as it is possible to produce efficient conservative compensatory changes in the muscular walls.

[These comprehensive general views, which are apparently—we had almost said unquestionably—correct, we prefer laying before our readers, without following Dr Fothergill further into the special applications of digitalis in the several forms of cardiac affection, because these general views contain sufficient to guide any intelligent practitioner, and because we believe that our present knowledge of the action of digitalis does not permit us to lay down any more accurate rules for its employment in any special form of cardiac lesion. Each case must stand on its own merits, but it is important to know that we have in digitalis a drug capable of producing a certain definite action.]

The contra-indication to the employment of digitalis is *par excellence* the presence of atheroma to any extent, and, next, fatty degeneration of the heart. But these objections are in a great measure theoretical. In the usual condition of general atheroma, the danger would be done away with by the serious impairment of the contractility of the arterioles. In fatty degeneration of the heart, the increased muscular action obtained by the action of the drug is sufficient to counterbalance any capillary opposition; danger from this cause seems hypothetical. In the purely speculative condition of partial degeneration of the ventricular walls, danger might accrue, but we must never allow our patient to die of cardiac asthenia from the hypothetical fear of rupturing a rotten section of the heart-wall.

The occurrence of intermittency during the administration of digitalis has hitherto been deemed a valid contra-indication of its use; and it certainly is so, if actually the result of the use of the drug: it is an evidence that its physiological effects have been reached. Thus, if we find the pulse thready, the heart's action a steady thud, and the bulk of the urine diminished, we must withdraw the drug. But intermittence is not always associated with these symptoms, and instead of being an indication for the withdrawal of the drug, is rather an indication for its more free administration. The diagnosis between these two forms of intermittency must rest in a great measure on the circumstances under which the digitalis has been administered. Thus, if given in hypertrophy and in a healthy person, the *a priori* probability would be that the intermittence was due to the over-action of the drug; while, if the digitalis were given in great cardiac debility and growing obstruction, or obvious failure of the heart's action, the occurrence of intermittence would be an evidence of the imperative necessity for an increase of the dose. Persistent vomiting, loss of appetite, noises in the head with flashes of light, or other symptoms of the system being fully under the influence of the drug, or of some idiosyncrasy on the part of the patient, would suggest its withdrawal, and either the use of some similar agent, or its administration in some other form or combination. Thus, many who cannot tolerate digitalis on an empty stomach, can take it without inconvenience if given an hour after food. Attacks of syncope or other cardiac failure, far from being any valid objection to its use, are, in fact, like intermittence, frequently an indication for more of it. Stimulants may require to be given along with digitalis, but failure of the heart's action is the result of the affection, and not of the drug. In digitalis poisoning from one large dose, we must of course at once empty the stomach; its effects on the heart either in this acute form of poisoning, or in a more chronic one, are to be counteracted by aconite, and possibly by the Calabar bean. From its action in improving cardiac contraction and in constricting the small arterioles, digitalis is an admirable remedy in various cerebral affections depending on anæmia of the brain, notably in delirium tremens, as was pointed out by Mr Jones of Jersey. For similar reasons, it also acts as a diuretic, not because it is specially eliminated by the kidneys, thus producing increased secretion, but solely because it increases the blood-tension in the arterioles of the glomeruli.

Whenever, from digitalis intoxication, the heart is approaching the state of permanent systole, the arterial tension becomes lessened, not from want of *vis a tergo* as in cardiac asthenia, but from defective supply of blood, the result of the unnatural contraction of the ventricles; hence diminished secretion of urine is one of the earliest and most delicate tests of digitalis poisoning.

As a useful means of keeping up the action of digitalis for a long time, Dr Fothergill recommends a pill composed of half a grain of the powdered leaves of digitalis, as much of the dried sulphate of iron and of cayenne, to be given in extract of gentian, or in the aloes and myrrh pill, one pill to be taken twice a day.—*British Medical Journal.*

HOW TO KEEP A HORSE QUIET who kicks during the night. This most annoying habit, which often produces unsightly swellings on the hocks, besides more serious injuries, is frequently the result of nervousness and ennui, and not of mischievous propensities. It is a form of hysteria of the limbs, to which others besides horses are subject; unfortunately, the same simple means of cure so efficacious in the horse is not so applicable to the human animal. To cure this disagreeable habit in the horse, all that is required is to attach a round ball of wood, weighing about two pounds, to the hind fetlock of the limb most commonly employed in this pastime by means of a leather strap two feet and a half or three feet long. Whenever he lifts his foot to kick, a blow from the ball at once administers a correction for the fault he is about to commit, and in a short time he gives up his bad habit. This plan has proved very successful. —*Art Medical*, and *Revue de Thérapeutique Médico-Chirurgicale*, 12th August.

DANGERS OF CHROMIC ACID.—M. Gubler remarks that chromic acid is one of the most powerful of caustics. Only the monohydrous sulphuric acid at all approaches it in strength. It acts rapidly, setting free a considerable amount of heat, so that the temperature may rise to 125 or 150 degrees. If we plunge a small animal, such as a mouse, into a concentrated solution of chromic acid, it is instantaneously reduced to a cinder; and the ebullition is so great that, unless care be taken, the mouse and a part of the solution are forcibly ejected. This caustic, applied over an extensive surface, may therefore give rise to a deep slough. Further, the absorption of chromic acid is not free from danger, and patients have been poisoned by a too extensive application of this caustic to the surface of their bodies.—*Gaz. Méd. de Paris*, and *Bulletin de Thérapeutique Médicale et Chirurgicale*, 15th August 1871.

Part Fifth.

MEDICAL NEWS.

University of Edinburgh—Graduation Ceremonial.—On Tuesday, 1st August, at 10 a.m., the formal "capping" of the graduates in the Faculty of Medicine took place in the Music Hall. The hall was completely filled upon the occasion by a brilliant assemblage of ladies and gentlemen. The Lord Justice-General, Chancellor of the University, occupied the chair; and was supported by Principal Sir Alexander Grant, the members of the Senatus Academicus, Dr Donaldson, Rector of the High School, and Bailie Miller.

Professor Charteris opened the proceedings with prayer.

Previous to the ceremony of graduation in Medicine, Professor Macpherson, as Dean of the Faculty of Law, presented the following gentlemen for the honorary degree of Doctor of Laws, introducing each of them with a brief statement of the reasons for which the degree was conferred:—Thomas Andrews, F.R.S., Vice-President of Queen's College, Belfast, and Professor of Chemistry in the Queen's University; W. B. Carpenter, F.R.S., M.D. Edin., Registrar of the University of London; Professor Challis, Cambridge; Auguste Golding, Denmark; John Peter Gassiot, F.R.S.; William Huggins, F.R.S., D.C.L. Oxon., etc.; M. Jules Janssen, Member of the Academy of Sciences, Paris; James Prescott Joule; G. E. Paget, M.D. Cantab., D.C L. Oxon., President of the Medical Council; W. Spottiswoode, F.R.S.; George Gabriel Stokes, F. and Sec. R.S., Lucasian Professor of Mathematics, Cambridge; James Joseph Sylvester, late Professor of Mathematics, Woolwich; Allen Thomson, M.D., Professor of Anatomy, Glasgow; and Pierre Joseph Van Beneden, Professor of Comparative Anatomy in the University of Louvain. These degrees were conferred in the usual manner, amid the applause of the audience.

Professor Bennett then presented the following gentlemen, who had been judged worthy to receive degrees in the Faculty of Medicine:—

Degree of Doctor of Medicine.—(Three stars indicate those who have obtained gold medals for their dissertations; two stars, those deemed worthy of competing for the dissertation prizes; and one star, those commended for their dissertations.)—*Candidates who received their degree under the new statutes:* —Joseph Brown, Scotland; **John Brown Buist, Scotland; *James Wilkie Burman, England; James Christie, Scotland; ***James Cumming, Scotland; Henry Dalton, Demerara; *John Janet Kirk Duncanson, Scotland; *Robert William Foss, England; Charles Edward Glascott, England; Geoffrey Hett, England; *Francis Raworth Heycock, England; Alfred Roberts Law, England; Robert Philip M'Laren, New Brunswick; Robert Munro, M.A., Scotland; Nathaniel Daniel Isaac Oman, Scotland; *** Urban Pritchard, England;

*David William Roberts, Wales; Claudio Lisboa Serra, Rio de Janeiro; William Henry Symes, England; Archibald Dunbar Walker, India, Strethill Henry Wright, Scotland. *Candidates who received the degree under the old statutes:*—*John Mitchel Hunter, England; Francis George Joynt, Ireland.

Degrees of Bachelor of Medicine and Master in Surgery.—Robert Archibald Adam, Canada; Reginald Gervase Alexander, England; Robert Harbin Alleyne, Barbadoes; Thomas Anderson, Ireland; John Armstrong (M.A. Edin.), Scotland; Harry Benjafield, England; Arthur James M'Donald, Bentley, England; Samuel Edmund Bligh, England; Frederic Adolphus Bond, India; George Bowman, England; John Storrs, Brookfield, Ireland; Joseph John Brown, England (with second-class honours); John William Buckell, England; Millen Coughtrey, England (with second-class honours); John Sim Cowan, Scotland; Hanmer Dickson, Tripoli; John Edward Dickson, Jersey; Justyn George Durham Douglas, Canada; Henry William Drew, Cape of Good Hope; Alexander Dunbar, England; David Richard Edwards, Wales; Richard Edward England, England; Charles Gowan, Scotland; Peter Gowan (B. Sc. Edin.), Scotland; James Grant, Scotland; Campbell Cave Greenidge, Barbadoes; William Hardman, England; George Home, Scotland; James Muir Howie, Scotland; Robinson James Hutchinson, England; James Jardine, Scotland; John Johnstone Salcomt Johnstone (B.A. Oxon.), England; Alexander Ewing Keith, Scotland; William Lemon Lane, India; Robert Lawson, Scotland; John Leitch, Scotland; Joseph Henry Little, Ireland; William Livesay, England; John Lowe, Scotland; Norman M'Caskie, Scotland; Donald Stewart Macdonald, Scotland; Johnstone Macfie, Scotland; Donald Macrae, Scotland; Herbert Coddington Major, Jersey; Thomas William Mawson, England; Henry Meadows, England; Augustus Nicoll, Jamaica; Joseph Chaning Pearce, England; Henry Alleine Perkins, Tasmania; William Sang, Scotland; John Catchick Shircore, India; George John Malcolm Smith, Canada; John Stiell, Scotland; David Thorburn Taylor, Scotland; John Thomson, Scotland; William Thomson, Scotland; Robert Thorburn, England; John Knowsley Thornton, England; John Moore Walker, England; John Thomas Wightman, Scotland; Edward Moon Wilson, Brazil.

Degree of Bachelor of Medicine.—John Clelland Clarke, Ireland (with second-class honours); Robert Taylor Sumner Eagar, England; George Harrison Evans, England; Matthew William Gairdner, Scotland; Henry Harvey, England; James Roland James, Wales; John William Macdonald, Nova Scotia; Edmond West Symes, England; Edward Willis Way, England.

The Ettles Prize of £40 to the most distinguished student of the year, has been awarded to Urban Pritchard, M.D.

After this, Professor Fraser presented for the degree of M.A. Mr J. W. Pringle, who had not been able to appear and receive the honour on a previous occasion.

Professor Bennett then delivered the Graduation Address, in which he first alluded cursorily to the unrivalled variety and extent of a medical education, and to the manifold and important objects it necessarily embraced in preparation for the great work of the physician, the preservation of the health and the treatment of the diseases of so complex an organism as man. He then pointed out that, notwithstanding the high value placed upon life and health, the laws regulating them are almost completely ignored by the community, and important measures necessary for the extinction of disease are inveighed against from mistaken views as to their theological bearing, stating that this tendency to place scientific doctrines in opposition to religious beliefs did not arise because scientific men were irreligious, but because religious men were unscientific. Of this fact Dr Bennett then proceeded to give what he considered to be various apt illustrations, culled from the fables of the ancients, Froude's address at St Andrews, and Addison's hymns, concluding with an earnest appeal for the introduction of physiology as an important branch of general education.

The benediction was then pronounced by Professor CHARTERIS; and the newly-capped graduates having received the congratulations of the Senatus, the proceedings were brought to a close.

A BUST OF PROFESSOR CHRISTISON was placed in the Hall of the College Library on the 29th of June last, and a *replica* of the bust was presented to his family. This distinguished honour, so rarely conferred, especially during the lifetime of the party concerned, has been well earned by a steady and consistent devotion to the interests of the students and of the University, as well as to the advancement of science during the forty-nine years that Dr Christison has been a member of the Senatus, first as Professor of Medical Jurisprudence, and latterly of Materia Medica. The bust is an excellent likeness, by Mr William Brodie, R.S.A.

THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE held its forty-first meeting at Edinburgh during the week extending from 2d August to 9th August inclusive. This meeting has been very successful, and included a total number of members and associates of 2463; of these 754 were ladies, and 21 foreign members. The money received for their tickets was £2575. Among the foreign members present were the Abbé Moigno; the Abbé Richard; Professor Szabo, Pesth; Dr Luroth, Carlsruhe; Professor Margo; Senor Arturo de Marcoartu, deputy to the Spanish Cortes; Dr Lutken, Copenhagen; Dr J. A. Boogard, Leyden; Dr G. H. von Baumhaven; Dr C. H. Buys Ballot, Utrecht; Professor Gilbert Wilson, Chicago; Professor Gotvos, Pesth; Professor Bierens de Haare, Leyden, etc. The proceedings were altogether of an interesting character, and seemed, moreover, in the anthropological section, to be somewhat exciting, judging from the behaviour of some of the members during the discussion of a few of the more sensational papers. The opening address of the president, Sir William Thomson, was somewhat too diffuse to deserve the characteristic of powerful, but it was interesting and well received, and concluded with perhaps the most sensational statement made during the whole meeting, viz., the possible origin of life on our planet from germs transported to it by a so-called aerolite—the fragment of an earlier world. A theory which may possibly be, as he [illegible] it is, perfectly scientific, but which, nevertheless, gives us no [illegible] to the actual mode of origin of life, really drawing a thicker veil over that origin. Various interesting communications were made to the different sections, but, upon the whole, there was a tendency to popularize, a deficiency in originality, and an absence of criticism, for which there was indeed not sufficient time, which detracted from the high scientific character of the proceedings, and tended to produce an impression unfavourable to the importance of such meetings in a strictly scientific point of view.

THE BRITISH MEDICAL ASSOCIATION held its thirty-ninth annual meeting at Plymouth on the 8th, 9th, 10th, and 11th of August, under the presidentship of John Whipple, F.R.C.S., Plymouth, whose address of welcome was mainly an epitome of the history of the town in which the Association were met. Dr George Johnson read the address in Medicine, and Professor Lister that in Surgery. The proceedings closed with a dinner. At this meeting it was resolved to remove the headquarters of the Association to London.

THE ADVANCE OF CHOLERA.—In the central and western provinces of Russia cholera has never entirely disappeared since its importation in 1865; in 1869 it again became epidemic, as occasionally happens after severe epidemics in those countries where local conditions exist favourable to its re-development. During 1870 it continued to exist, and towards the end of the year to spread to various parts, especially the seaports of the Black Sea, whither it seemed to be brought by those engaged in the transport of grain. In November 1870 it appeared at St Petersburg, where it continued to maintain its hold with gradually lessening force till July of the present year, when a less serious outbreak again commenced. Since that time it has progressed towards the west of Prussia, and has invaded Königsberg, where, on the 14th of August, the number of persons attacked was 62, and the deaths 22. Cholera has also broken out in Persia. It is satisfactory, however, to note that this epidemic is distinguished by the slowness of its progress, and by its mild character, the mortality being small in proportion to the number attacked. It is, nevertheless, within a week's sail of this country, and but for the active and efficient means employed by Government to arrest its importation, there can be little doubt but that we would probably have had a more or less serious outbreak of it; as it is, we think that an efficient quarantine will suffice perfectly to arrest any attempts to reach our shores, though that is no reason why we should relax in our endeavours to set our house in order in a more perfect manner than the French préfêt, who, when desired to prepare for cholera, telegraphed back that he had set all the able-bodied men to dig graves. In regard to the matter of prevention, the Board of Supervision has issued the following regulations to all the Local Authorities in Scotland having jurisdiction in terms of "The Public Health (Scotland) Act, 1867:"—

"I. The Local Authority shall forthwith take measures for the discovery and removal of all nuisances within the limits of their jurisdiction, in the manner provided by the said Public Health Act, and shall carry out such measures effectually and as speedily as may be.

"II. The Local Authority shall take measures to disinfect and deodorize all places from which any nuisance has been removed, and to enforce or effect the cleansing and limewashing of the interior of all rooms, stairs, passages, or houses which may be deemed to require it.

"III. The Local Authority shall exercise the powers conferred upon them by the 36th section of the said Act, to enter and inspect, by themselves, or by officers or persons by them authorized in this behalf, any premises where they have ground for believing that necessity may exist for executing in relation to the premises any of these directions and regulations.

"IV. The Local Authority shall exercise the powers with which they are invested by the 37th section of the said Act: and on obtaining, through the sanitary inspector, or the medical officer, or otherwise, sufficient evidence that any house or part of a house is so overcrowded as to be dangerous to health, shall regulate the same according to the provisions of the said Act in reference to common lodging-houses.

"V. In any case in which there is any doubt as to the wholesomeness of water used by the inhabitants as a beverage, or for dietetic purposes, the Local Authority shall take immediate steps to ascertain the quality of such water; and if it shall be certified, after analysis by a competent analytical chemist and by a qualified medical practitioner, or certified by two such practitioners, that the water of any well or other source used as a beverage or for dietetic purposes within the jurisdiction of the Local Authority, is so tainted with impurities, or otherwise unwholesome, as to be injurious to the health of the persons so using it, or calculated to provoke or aggravate choleraic or other epidemic, endemic, or contagious disease, the Local Authority are hereby required to take prompt measures for procuring wholesome water to be supplied in its stead, so far as the case requires, to the inmates of the houses situated within the limits of their jurisdiction, and to prohibit and prevent the use, as a beverage or for dietetic purposes, of the unwholesome water, and, if necessary, to shut up any well or wells from which it is drawn.

"VI. In order to enable Local Authorities, within whose jurisdiction any harbour, port, or anchorage ground is wholly or partly situated, to carry out promptly and suitably the 6th section of the Order of Council, dated the 3d August 1871, with relation to ships and vessels, measures shall at once be taken by such Local Authorities, if hospital accommodation is not already available to them, to secure and prepare a suitable room or house to which persons suffering from cholera, if such cases should occur, can immediately be removed for care and treatment, and in which they will have suitable accommodation, and sick-bed as well as medical attendance provided by the Local Authority."

LIST OF THE CANDIDATES OF H.M.'S BRITISH MEDICAL SERVICE who were successful at the Competitive Examinations held at London in February, and at Netley in August 1871, after having passed through a course at the Army Medical School, Netley.

Name.	*Studied at*	*No. of Marks.*
1. Crombie, A.,	Edinburgh,	5965
2. Stuart, G. B.,	Melbourne and Edinburgh,	5775
3. Irving, L. A.,	Dublin,	5335
4. M'Cracken, J. A.,	Belfast,	5320
5. Beamish, J. M.,	Cork,	5150
6. Clery, J. A.,	Dublin,	5060
7. Cruikshank, B.,	Aberdeen,	5040
8. Coats, J.,	Glasgow,	5005
9. Williamson, J. G.,	London,	4640
10. Bradford, H.,	London,	4630
11. Fawcett, W. J.,	Dublin,	4482
12. Joynt, H. W.,	Dublin,	4475
13. Saunders, W. E.,	London,	4470
14. Leckie, D.,	Glasgow,	4342
15. Charlton, W. J.,	Dublin,	4310
16. Ruxton, J.,	Aberdeen,	4300
17. Anthonisz, A. H.,	Aberdeen,	4185
18. Tobin, W.,	Dublin,	4170
19. Molloy, O.,	Belfast,	4145
20. Moylan, W. J.,	Dublin,	4120
21. Exham, R.,	Cork,	4056
22. White, W. L.,	Edinburgh and Aberdeen,	4016
23. M'Namara, J.,	Cork,	4013
24. Harman, R.,	Dublin,	3980
25. Wilson, J. B.,	Sheffield, Edinburgh, and Galway,	3860
26. Leake, G. D. N.,	London,	3812
27. Martin, J. W.,	Dublin,	3812
28. Robinson, R. H.,	Dublin,	3683
29. Gabbett, P. R. D.,	Montreal and London,	3677
30. O'Connell, M. D.,	Cork,	3636
31. Palmer, C. de M.,	Dublin,	3566
32. Ward, E. C. R.,	Dublin,	3558
33. Finlay, W.,	Dublin,	3537
34. Sullivan, W. P.,	Dublin,	3513
35. Joynt, E. H.,	Galway,	3486
36. Dickson, J. R.,	Kingston, Montreal, and London,	3450

SMALLPOX has been epidemic to a slight extent in Edinburgh of late, four deaths being recorded as having occurred in July. Most of the cases have been imported, but a few have originated from these imported cases. The continual smouldering in the smallpox wards of the antiseptic fuel of Dr Dewar of Kirkcaldy has been eminently successful in keeping them perfectly sweet and free from smell.

DIPHTHERIA of a very malignant type has been prevalent in Edinburgh of late—three deaths having occurred in April, eleven in May, thirty-two in June, and twenty in July. And the most remarkable point in regard to this epidemic has been its prevalence and fatality in some of the best districts of the city, and its almost entire absence from those low and overcrowded localities where zymotic diseases are most apt to rage, clearly pointing to a localizing influence which is certainly not ochlotic in character.

Medical Appointments.—Mr Jardine Murray was elected President, and Mr George Latham, J.P., was elected a Vice-President of the Medico-Chirurgical Society of Brighton and Sussex at the annual general meeting on Tuesday, 2d July 1871.

GOODSIR MEMORIAL FUND.

SUBSCRIPTIONS RECEIVED SINCE LAST REPORT.

Dr Beddoe, Bristol,		£1 1 0
Dr Marshall, Clifton,		1 1 0
Dr Henderson, Gainsborough,		1 1 0
Per Dr Duckworth, London:—		
Dr Andrew Clark, London,	£5 0 0	
Dr Day, F.R.S., Torquay,	1 0 0	
Dr Otte, Torquay,	1 1 0	
Dr Clifford Davies, Bury,	1 1 0	
Dr J. G. Smith, London,	1 1 0	
Dr Tom Hewitt, Windsor,	2 2 0	
		11 6 0
Dr Yellowlees, Bridgend,		2 2 0
		£16 11 0

PUBLICATIONS RECEIVED.

Biennial Retrospect of Medicine and Surgery. London, 1871.
J. Crichton Browne, M.D.,—West Riding Lunatic Asylum Medical Reports, vol. i. London, 1871.
J. Drysdale, M.D.,—Life and the Equivalence of Force. London, 1871.
Robert G. Glenn, LL.B.,—Manual of the Laws affecting Medical Men. London, 1871.
Alexander Harvey, M.D.,—Articles of the British Pharmacopœia, pointed according to their relative Values. Aberdeen, 1871.
Dr W. Kramer,—Die "Exakten" Deutschen. Berlin, 1871.
C. Ludwig,—Arbeiten aus der Physiologischen anstalt zu Leipzig. Leipzig, 1871.
E. D. Mapother, M.D.,—Animal Physiology. London, 1871.
William Squire, L.R.C.P.,—Puerperal Temperature. London, 1871.

PERIODICALS RECEIVED.

American Journal of Insanity,—July.
American Journal of Med. Sciences,—July.
American Journal of Syphilography and Dermatology,—July.
American Practitioner,—July, August.
Annales d'Oculistique,—May, June.
Australian Medical Gazette,—April, May.
Berliner Klin. Wochenschrift,—June 26 to August 21.
Births, Deaths, and Marriages, Monthly Return of,—June, July.
Births, Deaths, and Marriages, Quarterly Return,—June.
British and Foreign Medico-Chirurgical Review,—July.
British Medical Journal,—July 1 to Aug. 19.
Bulletin Général de Thérapeutique,—Sept. 30, 1870, to May 15, 1871; June 15 to Aug. 15.
Bulletin of the New York Academy of Medicine,—Nos. 10 to 17.
Food Journal,—July.
Gazette Hebdomadaire de Médecine, etc.,—June 23 to August 18.
Gazette des Hôpitaux,—Feb. 14 to June 13.
Journal of Mental Science,—July.
Journal de Médecine et de Chirurgie Pratiques,—March to June.
Klinische Monatsblätter für Augenheilkunde, April, May.
Madras Monthly Journal of Medical Science,—June, July.
Medical Press,—June 28.
Medical Times and Gazette,—July 1 to August 19.
Medical World,—July, August.
Medizinische Jahrbücher,—Jahrgang 1871, Heft 1, 2.
New York Medical Journal,—May, June.
Philadelphia Medical and Surgical Reporter,—May 20 to July 29.
Philadelphia Medical Times,—June 15 to August 1.
Practitioner,—July, August.
Revue de Thérapeutique Medico-Chirurgicale,—June 1 to August 15.
Virchow's Archiv,—June 23.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Sympathetic insanity illustrated—The Influence of the Body on the Mind, and the Mind on the Body.* By ARTHUR MITCHELL, M.A., M.D., F.R.S.E., etc., Commissioner in Lunacy for Scotland.

ECCENTRIC irritations, according to Reynolds, are nearly the most prolific cause of what he describes as genuine epilepsy. These eccentric irritations may be due to dentition, worms in the intestines, excess of venery, the establishment of the menstrual discharge, and a host of similar causes. Brown-Séquard also is of opinion that this is an exceedingly common cause of epilepsy. He says that in a large number of cases "there is an irritation from some point of a centripetal nerve, especially from its peripheric parts in the skin or in the various mucous membranes," and he believes that we can often avert the fit by preventing this irritation from going up to the encephalon. The importance of this view as to the origin of many cases of epilepsy may have been over-stated by some writers, but no one denies that it is important, and, in point of fact, it is to a large extent a guide of treatment in this disease.

I allude to this subject here only for the purpose of pointing to the fact, that fearful convulsions of the whole body may arise from what appear trifling irritations, at points far distant from the nervous centres. If I give an illustration, perhaps I shall more surely attain my object.

"Vic-D'Azyr relates the case of a woman, who had been subject to epileptic fits for twelve years, which at length became as frequent as four or five times a day. They always commenced with a peculiar sensation in one leg, near the lower part of the gastrocnemius muscle." A surgeon cut down on this spot, and found a hard cartilaginous body about the size of a pea, which he removed, dividing the nerve on which it pressed. After this the woman had no return of the epilepsy.

I take this case from Mason Good, who found it in the Dictionnaire des Sciences Médicales; but there is a still more apt and striking one related by De Morgan, on the authority of Mr Standert of Taunton, in whose practice it presented itself.

A boy of fourteen, on getting out of bed in the morning, became violently agitated, spoke incoherently, and broke the furniture. He was put into bed again, when he at once became composed and rational. He remained in this state till Mr Standert visited him, about five hours after the attack. He was then calm and cheerful, and there was no sign of any bodily disorder. He said he felt quite well, and wished to get up, and he was permitted to do so; but on putting his feet on the floor, and standing up, his countenance became instantly changed, the face became convulsed, and he was about to become unmanageable and destructive. Replaced in bed again, he was at once calm, though he looked surprised, and asked what was the matter.. Nothing had ever occurred in his history to indicate a tendency to such attacks.

He had been fishing the day before, and had been wading barefoot, and his legs and feet were therefore examined, but no scratch or injury was found. On lifting the foot, however (to examine the sole), by the right great toe, which was thus caught and pressed between the forefinger and thumb, the muscles of the jaws were again suddenly convulsed. On releasing the toe these effects immediately ceased. The toe was then closely examined, and on the bulb, nearly where the circumgyrations centre, there was found a very small elevation, as if a bit of gravel had got below the cuticle. There was no redness, however, nor sign of inflammation; but on pressing this point between the finger and thumb and against the nail of the toe, a slight convulsion instantly ensued. The boy said that he had no pain, but that it made him feel *very odd*. No scratch or puncture of the cuticle at the seat of the little elevation could be detected, but it was snipped off in the expectation of finding the point of a thorn, or a grain of sand. Nothing of the kind, however, was found. But the toe could now be pressed without injury. The strange sensation was gone, and it never returned.

These are two very striking cases. They are, in fact, selected for that reason. I use them here merely to illustrate the eccentric origin of some cases of epilepsy, desiring the illustration to be as clear as possible. It will be understood, of course, that in a host of cases, where the origin may be as truly eccentric, the connexion will be much less manifest. This indeed will be the rule. In the course of this paper I may have to repeat remarks to this effect, so that misapprehension may be avoided. I shall also have to point out occasionally, as we go along, that such eccentric irritations do not in every person produce these serious effects; that, on the contrary, they do so only very exceptionally, and perhaps never, except when there is in the individual some state of preparation. The frequent operation and great value of this state of preparation—or, in other words, of the predisposing causes of nervous and mental disturbance—should be kept always in view. They are very varied and complex; and in many cases the large and grave result appears to be due to a fortuitous concourse of adverse conditions. On these, however, some exciting cause acts in the end to light the fire, and it is clear that peculiar care should be exercised in preventing this spark from falling on material which is inflammable.

In the first of the two cases, no reference was made to mental symptoms, while in the second these were strongly marked. But in every epileptic there is, during the fit at least, a period of mental derangement—of unconsciousness, more or less complete, if nothing else; and in many cases there is much more,—this greater mental disturbance presenting itself both in epileptiform seizures, like those of the boy, and in fully-developed epilepsy. I desire the double influence of the eccentric irritation in the boy's case to be noted—that is, on the mind as well as on the muscles—because we shall have to refer to it again. My immediate object, however, is simply to show the production of muscular convulsions by these seemingly insufficient and unrelated causes.

If we turn now from epilepsy to tetanus, we find, in that variety of it which is called traumatic and which is by far the most common in this country, that nearly every case is strikingly referable to an eccentric origin; while the symptoms of tetanic spasm are even "more appalling and more immediately perilous" than those of epileptic convulsions. Dr Radcliffe says that tetanus may supervene on every description and in every stage of wounds. The most trifling injury may cause it, nor is an inflammatory condition of the wound essential. Indeed it may be almost healed and forgotten. Perhaps, punctured wounds are more likely to issue in tetanus than incised, and those in the extremities than those about the head, face, or trunk; but this is the most that can be said. Yet from such eccentric sources of irritation, there may result a state of such violent spasm and rigidity of the muscles that the body is supported on the heels and the occiput; and, in the great majority of cases, these spasms will go on without control to death.

In this great disturbance of nervous action, the mind may, and perhaps generally does, remain clear from the beginning to the end. In epilepsy, the cerebrum is the seat of the disorder. In tetanus it is the spinal cord.

Who can tell why a wound, which causes such terrible results in one man, should scarcely give inconvenience to another; or why at one time a man is thus affected by a wound, which at other times would have given him nothing more than temporary and slight discomfort? So far as I know, the only explanation we can give is found in that state of preparation or predisposition to which allusion has been made.

If we turn from tetanus to chorea—that singular disease which has been called an insanity of the muscles—we shall find that of it also there is a form which has been designated eccentric. Marshall Hall regards much of chorea as having this origin, and Gregory has detailed the history of several cases which are very illustrative. In one of these, the old teeth were remaining, while the new ones were appearing by their sides. The old teeth were drawn, and the removal of the chorea was complete.[1]

Dr Radcliffe says that, "it would seem as if the parts of the nervous centres which are concerned in the production of choreic movements may be affected from a distance by reflex action." "Nor is this to be wondered at," he adds, "seeing that there are facts without number which show that distant parts of the nervous system are continually being affected by reflex action."

It appears, therefore, that we have *not one* form, but *various* forms of disordered action in the muscles due to eccentric irritations. We have, in other words, sympathetic, reflex, or eccentric epilepsy, tetanus, and chorea.

But there is not only a reflex excess and waywardness of action in the muscles. There is also a reflex loss of power, a reflex paralysis, a reflex paraplegia. There may be some disputing about the exact nature of this state, but there is little or none about its existence, and it is generally admitted that paraplegia may be the result of disorder or disease beginning at a distance and affecting the cord secondarily and sympathetically. "Perhaps," says Reynolds, "the causes at work in producing all spinal maladies are reflex in their character as well as centric; reflex, it may be, rather than centric."

Among other diseases, those of the genito-urinary organs are believed to be the cause of this paraplegia. Brown-Séquard thinks that they are often the cause, and he relates a good case in illustration, which occurred in the practice of Rayer. Loss of power in the lower limbs came on in a patient soon after he was attacked by nephritis. The nephritis was improved, and the paralysis was at the same time improved. A short time after, the patient was again attacked with acute symptoms of nephritis, and lost the power of standing. The nephritis was again cured, and along with it the paraplegia.

Brown-Séquard thinks that there are two modes of reflex action by which these eccentric irritations may produce paraplegia—(1) by contraction of the bloodvessels in the cord, in the motor nerves, or in the muscles themselves; and (2) by a reflex influence on nutrition. He says he has *seen* a contraction of the bloodvessels in the pia mater of the cord, when a tightened ligature was applied to the hilus of the kidney or to the bloodvessels and nerves of the suprarenal capsules.

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[1] Watson's Lectures, i. 663.

In this form of paraplegia, perhaps, the eccentric irritations act generally (through the nerves going to the bloodvessels) in altering the nutrition of the nervous centres, and thus disturb their function. But we do not know much for certain in the matter, and it is difficult to make any theory apply everywhere. In this, however, as in many other things, we accept the facts, though we are unable fully to explain them. For instance, we know perfectly well, though we may not be able to explain the phenomenon to its bottom, that a pinch of snuff on the peripheries of the olfactory nerve, or even the going suddenly into bright sunlight, may lead to a reflex convulsive action of the muscles which operate in respiration; and we know quite as surely that similar eccentric irritations may produce the general convulsion of epilepsy or spasm of tetanus. There is, in fact, no essential or scientific difference between these last phenomena and the familiar phenomena of a sneeze. The difference lies only in the greater gravity of the former.

All this may appear to be somewhat irrelevant in a paper on insanity, but I do not think that it will continue to present itself in this light, when I point out that we have disturbances of the mind resulting from eccentric irritations in the body, just as we have disturbances in the muscles. We have also different kinds of mental, as we have different kinds of muscular disturbance with this origin. We have in mania and fatuity something like the analogues of convulsions and paralysis, and we have them arising from similar causes. This, in fact, is what is meant when we speak of sympathetic or reflex insanity, the story of whose production is so like that of the neuroses to which I have just referred, that we cannot escape from seeing the close alliance which exists between them, and the great desirability of studying them together.

To the medical man, every psychopathy has a corporeal substratum. Without this, it could only be regarded as vice or sin, for the treatment of which a knowledge of anatomy, physiology, and materia medica would scarcely be considered the suitable qualifications.

Our usefulness lies entirely in dealing with the relations of body to mind. Feuchtersleben says that the purely spiritual differences of men belong to the province of ethics; their purely corporeal to physiology; they engage the attention of medical men only on that line where they meet. To the physician, therefore, "every psychosis is, at the same time, a neurosis," though "every neurosis may not be a psychosis." That is, there may be disease of the nervous centres both with and without mental disorder, but no mental without some cerebral disorder. And thus the medical treatment of insanity rests on Shakespeare's idea that—

> "We are not ourselves
> When Nature, being oppressed, commands the mind
> To suffer with the body."

I proceed to illustrate these views by an account of what has been called sympathetic or reflex insanity, and I shall begin by noticing a phenomenon which is very familiar to all of us.

Man is said to be the only animal that laughs. He is about six weeks old before he begins. What infants laugh at who are somewhat above that age, we can scarcely tell; but all agree that laughter expresses in them some pleasurable state of the mind. In later life, most of our laughter occurs when the mind catches sight of some unfamiliar deformity, incongruity, or discord, either in objects, manners, creeds, morals, conventionalities, thoughts, or words. It is scarcely perhaps complimentary to human nature to deliver this opinion, and then to add that in adult as in early life laughter indicates a pleasurable state of mind. It will be observed that I do not call it joy or gladness, but simply a pleasurable as opposed to a painful state of mind—this being all that is necessary for my present purpose. Laughter, therefore, usually follows a certain state of mental action—that is, certain mental operations cause the bodily phenomena which we call laughter.

But we can reverse the process, and, by acting on the body, we can call up both the pleasurable state of mind and the phenomena of laughter. What else happens when the sole of the foot is tickled? Here we have a trifling irritation, as far as it can well be from the great nervous centres, producing a particular state of mind, and also producing those bodily phenomena which often follow that state of mind, when it is otherwise induced.

We get the same results by tickling other parts of the body—the armpits, the lips, and the nostrils—but we need only refer here to the sole of the foot.

We have all witnessed these phenomena so often that they fail to arrest attention, but I shall be disappointed if, after what has been said, they are not at once felt to be interesting and suggestive. A definite mental state, and definite muscular action, are produced when we gently rub the sole of the foot,—as if "head with foot had private amity."[1] When we tickle the sole of the foot we know almost for a certainty that laughter, and not sobbing or sighing, will be the result. We shall have the quick convulsive expirations of laughter, and not the quick convulsive inspirations of sobbing. We shall have the pleasant action of mind which laughter discloses, and not the unpleasant state which we reveal by moans and groans, or sobs and sighs.

Then, moreover, this remote, and seemingly insufficient irritation, calls up these psychical and physical phenomena not with our will, but against it. In other words, this sympathetic laughter is in a general sense involuntary. Would it be going too far to apply an uncomfortable word to the state of a man who roars with laughter which he cannot control, and which has no adequate or perceptible cause? Even when we see the tickling, does it not seem ridiculously insufficient and unrelated? But it may be going on out of our sight—it may even be something like the little elevated spot on the boy's great toe, which did not give rise in him to phenomena of a really more startling character than those of which I now speak. If this involuntary laughter should *continue*, how far would the subject of it stand from a state of sanity, and how near to a state of insanity? How should we practically regard the matter then, and where should we put the unfortunate sufferer to get rid of him?

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[1] George Herbert.

I do not wish to push this familiar illustration of my subject too far, nor am I at all to be understood as describing or explaining the phenomena of laughter from titillation. To many of these, it is unnecessary, for my purpose, even to make allusion—such, for instance, as that a man can scarcely provoke laughter by tickling the sole of his own foot; that though the sensation cannot be called painful but rather pleasurable, "there is ever," as Bacon says, "a starting or shrinking away of the part (tickled) to avoid it;" that the skin must be *softly and lightly* and *not roughly or heavily* touched, in order to excite laughter; that though the phenomena are to a great extent involuntary, they are by no means entirely beyond control.

There are two points, however, to which I would refer. One of them is this:—Is it not the case that some are provoked to laughter much more easily than others by such things as tickling the sole of the foot or the armpit? If so, how do these differences occur, and what meaning have they? If I explained them by saying that in those who are easily provoked to laughter, in this or any other way, there is probably a mobile or unstable state of the nervous system, I should be doing what I desire to avoid, and what in writing on such subjects can only be avoided by an effort—that is, I should be appearing to give an explanation, when in reality I was giving none. If I accounted for these differences by degrees of mobility and stability in the nervous system, I should have still to explain what this means—a task, I fear, which I should fail to accomplish satisfactorily. Yet I think all will agree that when we speak of a mobile and unstable state of the nervous system, the words call up to the mind a state with which we feel familiar, and which we think we can recognise. When our knowledge is deeper, perhaps we may use other and more definite words in speaking of it; but in the meantime, with these qualifying remarks, it is sufficient for my purpose, and may be of practical importance, if I succeed in indicating one of the *recognisable* states of preparation for being *easily* or *not easily* acted on by such eccentric irritations as that under notice.

The other point to which I desire to refer is this:—What would happen if the tickling were persisted in—in other words, if this irritation of the peripheral nerves were kept up? I have no facts enabling me to give a definite answer to this; yet I think I am justified in asserting that the effects might be serious. I am sure that no prudent man would sanction the prolonged or persistent tickling of a young child. In adults the laughter cannot so readily be kept up as in children; but in them it can be sufficiently prolonged to cause the pleasurable feelings to give place to feelings of discomfort, distress, or even pain, which feelings are not then referred to the foot but to the head, and they may end in tears and sobs—a totally new and opposed set of phenomena. We may safely assume that changes of nutrition will occur in those parts of the nervous centres which are excited into such lively action, if it be prolonged; and that the functions of such parts will thereby be modified, while other parts may at the same time be called into abnormal action. In ordinary circumstances the laughter will cease or become feeble as soon as it begins thus to act injuriously. And whenever it ceases there will of course be the commencement of a return everywhere to the normal state—a return which will be safely and quickly accomplished, provided that the departure has not been great, and that there were not previously weak points in the nervous centres requiring only some unusual action to induce in them a serious derangement.[1]

If what has already been said does not lead to some understanding of how a trifling eccentric irritation may cause grave lesions of mind and body, it is because I have been unable to state my case clearly and its illustrations aptly, and not because the case itself is not clear, or the illustrations inapt. In the hope, however, that I have not failed in my object, I shall proceed now to show that we meet, in actual practice, many cases of insanity which we believe to be due to these eccentric irritations, and that the lesions they inflict on the mind are not less grave, and not less frequent, than those we found them inflicting on the body when we spoke of epilepsy, tetanus, chorea, and paraplegia.

In doing this, I shall be steadily disclosing the intimate and singular relations of mind to body and body to mind—proving, at every step, that "like the jerkin to the jerkin's lining, so is the body to the mind—rumple the one and you rumple the other."

The most notable, perhaps, of these sympathetic insanities are those in which the eccentric irritation lies in the colon. Esquirol seems to have suspected that this was a prolific cause of insanity, but the subject has been more fully discussed by Schroeder Van der Kolk than by any other writer; and the prominence which he gives it I believe to be no greater than it deserves. It is also well handled by Greisinger, Morel, Maudsley, and Blandford. I shall state, as briefly as I can, what is known regarding it, drawing my description chiefly from the first of the observers I have named.

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[1] Rausius Textor gives a list of persons who died laughing; but it is a common saying that laughter never actually kills. Perhaps, for the reasons I have given, the saying may be in a sense correct. The deaths of Chrysippus and Philemon, however, are said to have been immediately due to fits of laughter, provoked, in both cases, by the sight of an ass eating figs out of a plate, from which we may safely infer that the story of their deaths is a fable.

First, then, what are the mental phenomena which present themselves, and have they any distinctive character? The answer to this is that, in the insanity which comes from this source, there is almost invariably a depressed or melancholic state of mind; but more than this, the depression has certain characters which tend to distinguish it from depressions due to other causes. The mental phenomena of course differ more or less in every case, but they show a sufficient sameness to be fairly regarded as distinctive. It has been said that, if two men were in every respect absolutely the same, an identical cause of mental derangement in them would probably be followed by identical results. But we never have these conditions. Their absence, however, is not more apparent in dealing with mental, than in dealing with bodily diseases. Thus, no two cases of smallpox are absolutely the same, yet both may be unquestionably cases of smallpox. So it is with mental diseases; and when we fail in noticing a general agreement between two such cases of insanity, it may often be due to the fact that we are not in the habit of examining the mental signs of disease, while we are all educated and trained observers of the bodily signs.

In melancholic persons, then, whose mental disorder proceeds from some eccentric irritation in the colon, along with the general feelings of depression, sadness, and gloom, there are engrossing self-accusations of wickedness and baseness either in the present or in some past time. They persistently calumniate themselves. They regard their fits of sadness as qualms of conscience. They have rendered their relations or friends miserable, or have plunged them into poverty. They have been cheaters, peculators, and have used money which did not belong to them. They have shown a wicked want of affection towards parents, wives, or children; they are the cause of other people's sorrows, sufferings, and losses, and are waiting to be punished; they must not eat, because they have wasted their money, and have none left to pay for food; they have deservedly fallen under contempt, and so on. In short, they are depressed and sad, and they say they are so, because conscience is awakened in them to a sense of their great wickedness, and they are accordingly loud and unceasing in their self-accusations. Such is very much what Van der Kolk says.

Frequently these mental symptoms, in a mild form, are found to have existed for a greater or less length of time before the patient comes under the notice and care of a physician. And in this early stage he may show a control over his distressing feelings, and be able to conceal them from all but his most intimate friends.

So much for the *mental* signs. As regards the *bodily*, there may be a good appetite, but it is generally bad, with a foul breath, and food is sometimes altogether refused. The hands and feet are cold, and the pulse small and contracted. There is sleeplessness—sometimes almost complete. Even when such patients sleep after going to bed, they waken early, and in the morning their state is generally one of greater misery and wretchedness than towards evening; as, indeed, is the case with most melancholics. In not a few instances, pressure on the upper part of the neck causes an unpleasant feeling in the head. Lastly, there is in every case marked constipation, and in most cases this long precedes the mental derangement.

This constipation is associated with states of the colon, which are described in Welscher's work, in an article "De Quibusdam Coli Affectionibus," written by Van der Kolk. The descending colon is believed to be the suffering part in the first instance. Constrictions or narrowings occur in it, of a spasmodic or organic nature, either above or immediately below the sigmoid flexure. When below it, the flexure itself is distended with gas, and widened, lengthened, and often pushed up to the transverse colon. When above the flexure, then the transverse colon is distended, widened, and lengthened, so as often to fall down to the pelvis. These changes and displacements may in some cases involve both the descending and transverse colon, but the narrowings or constrictions have not been observed either in the ascending or transverse parts of the gut. At the seat of these narrowings the coats of the colon may be thickened, but in other parts they are thinned and stretched. Its mucous membrane generally has a healthy look, but in some instances ulcerations occur.

It is Van der Kolk's opinion that in most cases these displacements and elongations of the colon have arisen through previous spasmodic contractions and strictures of the left portion, and that constipation in the first instance leads to these, which in their turn mechanically increase the constipation. And so the gut just above the stricture becomes filled with hardened fæcal masses, while the rest of the gut, back even to the cæcum, is more or less permanently distended with gas. The presence of these fæcal masses at the seat of the constriction is supposed to cause the irritation, which acts sympathetically and injuriously on the brain, and gives rise there to the peculiar morbid action which has been described.

We shall not stop to inquire how such conditions of the colon as have been alluded to would affect the liver, the circulation in the vena cava, the nutrition of the sympathetic, or the sexual organs. Beyond doubt their influence would be considerable, and in this way the mental disturbance might be either simply intensified, or modified and changed in its character. For instance, we have reason to believe from observation, that when irritation, thus induced in the sexual organs, acts on the brain and contributes to the insanity, it gives "a peculiar hue and special character" to the melancholic ideas.

It must not be supposed that any one holds that insanity will appear in every instance, or even in the majority of instances, in which such conditions as have been described occur in the colon. We know the reverse to be the fact. Where it does follow, there must have been in all probability some predisposition or particular excitability of the nervous system. We trace and refer tetanus to wounds without hesitation; yet every one holds that such wounds would, in the vast majority of cases, be followed by no such injurious effects. So it is—by like evidence and like reasoning—that we trace the insanity of many persons to these affections of the colon. The proof is as good in the one case as in the other, and in both is good enough to get even beyond the region of that probability, which in so many matters must be the guide of life.

We find—(1) that these affections of the colon are exceptionally common in the insane; (2) that those of them in whom they are found generally display certain mental phenomena; (3) that, reversing it, where the characteristic mental manifestations occur, we frequently find the local affections; and (4) that when the treatment of such patients is directed by these views, it is often successful.

It depends on the truth of this last statement whether the subject has a practical importance. My own opinion is, that it has a high practical value; and that if medicine is ever to be of much use in averting and curing insanity, one of the ways by which this usefulness will be attained lies in the careful study of the effects on the brain of eccentric and removable irritations such as these.

Thus, a gentleman some time ago called on a physician and stated that he was labouring under great depression of spirits, at once adding that his condition could be explained, for he had been guilty of the most abominable wickednesses, for which his conscience was troubled. During the whole interview he kept accusing himself of crimes which he had never committed, and said that he deserved and expected some terrible punishment, and that life was becoming unendurable. He said that he had been unhappy for a considerable time, but that of late his misery had been greatly increased. He was unable to give any attention to business, so engrossing and overpowering were his distressing thoughts. He was sleepless, his tongue and breath were foul, and he said that he was and had long been extremely constipated.

An aperient was ordered, and he said acted well, but he was not relieved in mind. The aperient was ordered again next day, and again acted well, but with little relief to his distress. A third aperient was given, and there followed a very copious discharge from the bowels of hardened fæcal masses. Immediate and almost complete relief of the mental symptoms followed this, and there was no return.

The fair inference here is, that the view which directed the treatment of the patient was sound. It is probable that in this case the fæculent mass was just above the sigmoid flexure, and that it was perforated or tubular, allowing the passage of the matters which followed the two first aperients.

It must not be expected, however, that we shall often have a good result so quickly or satisfactorily as in this case; for where the sympathetic irritation of the brain has lasted for any great length of time, its nutrition will have been so affected, and such changes will have occurred in it, that we cannot look for an immediate relief, when the eccentric irritation, which has really originated the mischief, is withdrawn. We shall in fact *very frequently* find that the change in the brain has become permanent, and quite beyond all aid from the art of medicine.

The cerebral injuries resulting from eccentric irritations in the colon, of which we have been speaking, are of a very grave character. But there is an unhealthy action of the mind, of a minor, less marked, and less serious character, which results from the same or similar causes, and which is frequently seen. I refer to the condition of mind which so commonly attends what we call an overloaded state of the bowels—constipation, in other words. It is probably within the personal experience of many of my readers, that obstinate constipation causes them to be irritable, depressed, dissatisfied with themselves, and incapable of seeing any but the dark side of events. Now, this is nothing but a minor manifestation of what has just been described as insanity or melancholia. In their nature, and scientifically, the two states are the same. They have the same origin, and are removed by the same means. In both, the distant local irritation influences cerebral action in exactly the same way, whatever that may be. Indeed, as has been well observed by Dr Maudsley, "The earliest and mildest effect of sympathetic morbid action will be, as it is with the effect of vitiated blood, to produce a modification of the *tone* of nervous element, which is functionally manifested in disordered emotion. But the *continued* operation of the morbid cause will be apt to lead to a systematized disorder in the supreme cerebral centres; in other words, to the production of a delusion, or of a definite derangement of thought."

The mental phenomena in these minor sympathetic disturbances are quite of the same character as those found in the major. They are both states of depression and self-dissatisfaction. This is a valuable fact, and goes to support the views we have been expressing; for if we admit the actuality and sufficiency of the cause in the milder mental disturbance, we can scarcely refuse to do so in the graver. It is interesting, again, to find the tolerably steady production of a definable class of mental phenomena by a definable local irritation, occurring in a region and organ far away from the brain, and, to general observation, unconnected with it. A loaded rectum or colon does not produce hilarity and laughter, and tickling the sole of the foot does not produce sadness and gloom. Can we reflect on these things, and not feel that there may be something under them of which our philosophy hath not yet dreamt; that every approach to a knowledge of that something will be an increase of human happiness; and that no higher study could possibly engage the attention?

There is another aspect from which we may fairly regard the depressed states of mind which are at times produced by affections of the colon. It is this. If we call up these feelings of depression by mental or moral agencies, is there any region of the body in which we feel discomfort? When we have a real qualm of conscience, is it not attended with some bodily uneasiness, and where is that situated? Not in the limbs, or the back, or the head, but in the region of the stomach or transverse colon. This is matter of common observation and experience. And it is surely instructive and interesting, if true, to find that irritations in a particular region of the body produce a special train of mental phenomena; and that, on the other hand, uneasiness in that same region of the body is felt when a similar mental state is called into existence by moral causes.

If it were asserted that irritation of the gastro-intestinal membrane, at any point of it, tends to produce a depressed and uneasy state of mind, the assertion would admit of a certain defence. An ingenious speculator might go further, and say that there were some grounds for the opinion that certain irritations of the skin tend to affect the operations of the mind in one way, those of the gastro-intestinal mucous membrane in another, and those of the pulmonary mucous membrane in another,—that, for instance, those of the skin generally produce pleasurable and exciting, while those of the intestinal mucous membrane produce distressing thoughts. In fact, speculations of this nature have actually been adventured.

For instance, Feuchtersleben tells us that—"The view with which Nasse set out, and which, after many other attempts, Klencke, in his System of Organic Psychology, has been lately endeavouring, after Carus, to carry through, that there is a positive reciprocal relation between the several organic systems and the several psychical functions,—that, so to speak, every organ has its psychical signature (though not always according to the overstrained explanation of Klencke), is certainly founded on experience." I would beg to point out, however, that this view of the relation of body to mind, if there be truth in it, passes certainly into error when the precision and size of the psychical signature are exaggerated, for that signature is seldom more than legible, while in most cases it is illegible.

Allied to this speculation of Nasse and Klencke is the observation which Jadelot has revived, "and with which the older physicians were not unacquainted, that the diseases of the three principal cavities of the body are indicated by particular expressions of the countenance," which again represent particular states of mind.

We are at trouble here to avoid all such speculations—contenting ourselves rather with the story of the facts, some of which I fear would scarcely suit such theories.

For instance, it is thought that there is a sympathetic insanity due to an irritation in the gullet, in which the mental phenomena are as unlike as they can be to those believed to be produced by cerebral sympathy with irritation in the colon.

The ascaris lumbricoides occasionally penetrates to the œsophagus, and when it does so, it is sometimes not readily dislodged. It appears to be tolerably well established that its presence there occasionally produces an irritation, which may be reflected to the brain, and may cause mental derangement. It is probable, of course, that so serious a result will only occur in persons with unstable nervous systems, and predisposed, by heredity or by some other cause, to cerebral disease.

Laurent gives the details of a case of insanity apparenty depending on the presence of a worm, 18 to 19 centimètres long, in the œsophagus. The mental symptoms which presented themselves in that case, were those of an acute mania, or rather perhaps of acute delirium, which was continuous and exhausting, and ended in death.

He says that similar cases have been observed by Ferrus, Frank Vogel, Rolland, and Friedrich, and that the morbid mental manifestations had always the character of a continuous mania or delirium, accompanied by more or less limited convulsive phenomena and great prostration.

I need scarcely direct attention to the interest which attaches to the alleged steady character of the mental phenomena. They are produced, M. Laurent thinks, by irritation of the great sympathetic, conveyed to the central organ,—which may bear the irritation without injury, or may yield to it if there exists a preparatory unstable condition.

With reference to such cases, M. Laurent asks: "Is the lesion of the œsophageal nerves capable of determining one form of delirium rather than another?" and he answers this by asking another question. "May not," he says, "the feeling of constriction, or whatever may result from the alteration of œsophageal branches which belong to the laryngeal plexus, or to the thoracic portion of the great sympathetic" (may not, in other words, the irritation, whatever be its nature, from the presence of a worm in the gullet), "have some special echo in the intracranian nervous system?" By way of completing the answer, I would add another question to his, and ask, Have we not just such a special echo when we tickle the sole of the foot? Does the doing so make us sometimes laugh and sometimes groan? Does it not rather make us always laugh?

It is perhaps of importance to point out here, that during those melancholic or depressed states of mind, which are remotely referable to irritations in the colon, there may and do occur periods of excitement amounting sometimes to mania, but these are maniacal or excited states implanted on melancholia, and, when they subside, there is a reversion to the same characteristic depression. It may seem odd to say so, but even during the excitement the melancholia or mental distress is not absent.

When disordered cerebral action, due to sympathy, has lasted for a long time—and, if the sympathetic disorder be active, the time will not be very long—the nutrition of the brain is so interfered with as to produce changes in it which we may call structural. Then, the removal of the irritation will not remove the insanity, which in fact has ceased to be sympathetic, and has become due to disease in the brain itself. I have pointed this out already, but I do so again in order to state that, when such structural or other change has taken place, the mental symptoms may and probably will change considerably, and they may eventually lose all that was characteristic about them in the early stage of the malady, when they depended on a functional sympathy of the brain with some distant bodily disturbance.

In the states of reflex or sympathetic insanity to which we have hitherto referred, the patients are usually not conscious of the existence or situation of the irritation which is giving rise to the cerebral disorder. The melancholic, for instance, does not refer his depression to the colon; the maniac shows no consciousness of any irritation in the œsophagus; the boy did not trace his convulsions and odd feelings to his big toe; the victim of tetanus says nothing of the trifling wound he got; and so on. In other words, there may be no pain or uneasiness where the irritation itself exists.

This, perhaps, is very generally the case, but it is not necessarily so. The *aura epileptica*, for instance, may be an illustration of a conscious reference to the eccentric irritation. But *pain* may cause a disturbance of mental action, and the pain of course is definitely referred to a particular part of the body. The mental disorder thus induced is called sympathetic, and the mode of its production is thought by some to be more or less analogous to that of the mental disorders of which we have been speaking. It is certain that there is a sufficient resemblance to make it desirable to refer to the matter here.

For instance, "a whitlow on the point of the finger is often so excruciatingly painful as to throw the brain into a state of excitement incompatible with sleep, thinking, or sound feeling, and sometimes even into positive delirium." As Dr Andrew Combe remarks, "it is the brain alone which feels intense pain, and it is its affection alone that gives rise to the restlessness, anxiety, and depression which characterize many painful diseases." The delirium brought on by the whitlow differs in no respect scientifically from insanity. So long as it lasts, it is a state of mental disease. But actual delirium, which is the expression of a high degree of morbid brain action, may be absent, and yet there may be present a lower degree of unhealthy action, induced by the pain of the disease, and this may, if long continued, leave permanent effects —often seen in that condition of the nervous system which we can only describe as loss of tone. Eventually, this may prove a great misfortune. When fresh adverse circumstances arise, their injurious action will be promoted by the instability of the nervous centres, which may then be of old standing, but which favour the production of the insanity that concludes the story of the individual. Long-continued painful diseases in childhood have unquestionably the effect of permanently lowering the tone of the nervous system, and of rendering it unfit to come scathless out of trials which should not be overwhelming. I have particularly observed that this condition is apt to follow purulent ophthalmia, scalds or burns, and confluent smallpox. Indeed, when maniacal states of mind occur in early childhood, I believe it will be often found that they are in very close connexion with some protracted painful disease.

It appears to me that these views as to the origin of many cases of insanity are of practical importance. They indicate the means of prevention and of cure, and they disclose something as to one of the ways in which insanity arises, which is not so generally known as it should be. On many of the points discussed, "I may not have informed men more than they knew, and yet perhaps I may have given them occasion to consider more than they do."[1]

This subject will be resumed in the next paper.

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[1] Sir William Temple.

ARTICLE II.—*On Artificial Tuberculosis, and its relation to Cellular Pathology and the Growth of Tumours.*[1] By JAMES F. GOODHART, M.B. Aberd., etc.; Pathological Assistant in the Hunterian Museum of the Royal College of Surgeons of England.

IT has been said, "The different steps in attaining knowledge are marked by the acquirement of new laws or rules, expressing that to the whole of a given class of things some mark or property belongs"—and that "whenever things are really definite, as having some marks that group them into a smaller group by themselves, science requires that instead of appearing as part of a larger class, they should have their own name and position."[2]

True as these remarks are when applied to the exact science of thought, they are not the less applicable to that of medicine, since few there are who do not in their earlier years of study and practice frame for themselves certain general laws, which, as experience becomes larger, the insight into the workings of disease somewhat deeper, and the appreciation of minute variations in the conditions of the state called health more real, gradually recede into the background, displaced by the countless exceptions which would appear to put all laws at defiance, and to extinguish the hope, should any yet remain, of ever attaining to a perfect system in medicine.

"Knowledge brings doubts and exceptions and limitations which, though occasionally some aids to truth, are all hindrances to vigorous statement."[3]

Every day the tendency is more and more to make the mind a *note-book* of individual cases, which may serve as standards of comparison, rather than a compendium of rules to be slavishly adhered to. Thus is everything called by its own name, each single case has its own pathology wherein it differs from others of its class, and classification is by this means practically ignored.

While, however, from such an analytical process the life-history of disease is clearly traced, and the links in each chain are gradually ranged in proper order, it is possible that attention, concentrated on minute particulars, may narrow our conceptions of any subject as a whole, and by so doing we may miss entirely the real import of symptoms and pathological conditions, and elaborate an error in the search for truth. In disease, as elsewhere, primary and secondary causes cannot be considered apart; coexisiting phenomena must receive their due value as modifying agents, the warp and the woof of the web must be unravelled together; if otherwise, the fabric is spoiled. Thus has it been with the product tubercle, which, during the last few years, has been so prominently and frequently under discussion. In studying it we were in great danger of losing ourselves in detail and minutiæ, because, omitting to reflect upon the results of our investigations, we did not notice to what end they pointed. Latterly, however, important clinical and pathological facts have been brought forward, helping to point out the relationship of tubercle to other morbid products, but additional evidence is still wanting ere it can be rescued finally from the time-honoured category of *unorganizable fibrinous exudations.* It is my object to bring forward some such evidence in this paper; and though the ideas embodied in it may not open up any new line of thought, they will, I think, inasmuch as they are the result of independent experiment and observation, strengthen somewhat the position of those who have already pushed the doctrine of artificial tuberculosis to what must be considered their legitimate conclusions, and help towards obtaining for the tuberculous state its true position in a pathological scheme, as the connecting link, so to speak, when viewed with its surroundings, between various diverse morbid conditions.

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[1] Being the substance of an essay which obtained honours at the Medical Graduation at Aberdeen, in April 1871.

[2] An Outline of the Laws of Thought. By Archbishop Thompson, F.R.S., etc.

[3] Companions of my Solitude, 6th ed., p. 21.

In the first place, then, what is tubercle?

All the older writers on this disease may be classed in three groups; of which one, including Rokitansky, Bennett, Ancell, and Lebert, declares it to be a low formed exudation; a second, to which belong Williams, Henle, and Addison, that it is a retrograde metamorphosis of pre-existing tissues; while MM. Lallemand, Cruveilhier, and Andral considered it to be a concrete form of pus. Opinions were thus divided till M. Villemin published his "Researches on the Inoculation of Tubercle," in 1865. Those experiments I afterwards repeated myself, making use of blood, pus, tubercular sputa, cheesy matter from tubercular ulcers, cancer juice, etc., for the inoculation. It is quite unnecessary to give a detailed account of these here, now that the results of similar experiments are well known; suffice it to say, that my own observations completely coincide with those of Drs Burdon Sanderson, and Wilson Fox, published after most of mine were made,[1] and which show that—

1*st*, Tuberculosis may be with certainty produced both in the rabbit and guinea-pig (in the dog also, according to Cohnheim), either by the production of an abscess in any part of the body, by the introduction of foreign matter under the skin, or by injecting pus, tubercular matter, etc., directly into one of the serous cavities.

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[1] Dr Alison, of Edinburgh, had, as early as 1829, published the results of some experiments made by Dr Kay, at the Royal Infirmary, in which the introduction of mercury into the trachea of the dog had produced an apparent tuberculosis. In the centre of each tubercle, however, a small globule of mercury was found. This probably made the results appear less conclusive than they would have been, had the foreign matter been distant from the secondary tuberculosis; and to this cause may probably be attributed the fact, that these did not awaken that amount of discussion to which they were certainly entitled.

2dly, The new product tubercle is a formation of tissue composed of large numbers of lymph-like corpuscles and nuclei embedded in alveolar spaces.

I wish also to insist on the fact, that the disease attacks the animal in one of two ways—either by direct contact of the morbid material with a secreting surface, on which it can engraft itself, which may be called primary infection; or else, by the production of a cold abscess, to borrow the phrase, it extends along the lymphatics, the system being affected secondarily as the result of the abscess. The former plan generally obtains where pus or contagious matter is brought into direct contact with the pleura or peritoneum. Thus, in one of my experiments, some pus expectorated by a patient affected with tuberculosis was injected into the abdominal cavity of a guinea-pig; the animal died in thirteen days' time, and I found general miliary tuberculosis of the omentum and mesentery. The solid organs and the lungs only showed signs of commencing disease. The second method is ordinarily seen when a subcutaneous inoculation has been made.

The ultimate microscopical appearance of this new, or adenoid material, as it is called, is the same in all the tissues attacked by it, whether it be produced artificially or otherwise; but the details of its progress vary somewhat, according to the site of the disease, and the mode of its onset. By the so-called primary infection, a direct process of seed-sowing and growth takes place. By the secondary, a more complex method is necessitated.

Thus, in the brain, as is well known, the new formation occupies the lymphatic spaces immediately around the vessels, and is nothing more than an excessive development of the cells normally existing there. In the omentum also, much the same process goes on. I find similar lymphatic spaces existing in large numbers, and the growth commences within these, as in the brain, immediately outside the vessels. From within it spreads to the glands and fat-depots immediately outside the perivascular spaces (possibly this may be brought about, as I have reason to think it may be, in inflammatory conditions, by the molecular disintegration of the fat-cells), the lymphoid cells gradually increase in number, till at last the adipose matter entirely disappears, and what are known as tubercles are found.

Thus far, then, be it observed, the disease is confined to the vessels and parts immediately outside them, to the network itself, while the meshes of the net are still unattacked. The delicate connective tissue which fills in these spaces appears to be invaded from the parts already attacked, and to be only a stage later than that which has already been described.

The connective tissue nuclei swell out, and, proliferating, join on to neighbouring cells, till, from the diseased structures outside the vessels, there juts out a process of swollen granular cells; this gradually extends into the parenchyma, forming, so to speak, an animal spongiole; small tubercles form on these and in their vicinity, and it seems possible that these spongioles may ultimately form lymphatic channels, after the manner of the formation of blood-vessels; but I have been unable in any instance to detect the intermediate stage of partial formation of a canal. Whether the infection be primary or secondary seems then to make this difference, that, whereas in the former, where the inoculating matter is brought into direct contact with a moist secreting surface, all parts of the membrane are attacked simultaneously; in the latter, the parenchyma only suffers by a gradual process of invasion from the perivascular spaces. I have already given one illustration of the first method, in the case of a guinea-pig, where the disease was produced artificially in the omentum; let me now add another, where it occurred apparently in the same way in the brain of a child.

CASE 1.—William B., æt. 19 months, was admitted to the Evelina Hospital in 1869, under Dr Hilton Fagge, with all the symptoms of tubercular meningitis. He quickly became comatose, and died in three or four days. At the post-mortem, after taking off the calvarium and dura mater, the whole surface of the brain was found to be covered with a thick layer of green pus, the same material was found at the base, a little way down the cord, and in the ventricles. On washing this away, and looking for tubercle, none was found. That is to say, no nodular growth had taken place around the vessels, as is usual in this disease; but when the membranes were examined microscopically, after being washed and stained with carmine, then multitudes of small points of adenoid growth could be seen all over the field, and localized in no one part more than another. The lungs also were scattered over with yellowish punctiform dots. No gray tubercle existed anywhere.

In the lungs, the growth takes on the same corpuscular form, and is found distending the alveolar wall. It is also accompanied by what Dr Sanderson calls *catarrhal pneumonia*, which is an increased epithelial formation from the surface of the air vesicles.

Something like this, then, is the present view of tubercle; and assuming, as indeed we believe, that it is a correct one, certain conclusions may be drawn from it:—

1*st*, That tubercle is not an exudation of fibrinous cacoplastic material, nor a retrograde metamorphosis of pre-existing tissues.

2*dly*, That it is essentially a growth[1] just as much as is any tumour, and that it is perhaps *generally*, but by no means always, an overgrowth of the elements already existing in the parts affected.

Now, what has been proved to be true in the lower animals concerning the production of tuberculosis as the effect of a caseous abscess, is probably true of man also, save that it does not follow of necessity because a patient has a chronic abscess or a suppurating sore that he must become tubercular. What I have to do, then, will be to show that such a sequence of events does at any rate occasionally take place, and to offer an explanation, if any can be found, of those cases of prolonged suppuration in which tuberculosis does *not* occur, and also of those at first sight even more puzzling ones, in which tubercle is found unassociated with manifest suppuration or exciting cause, and which have all till lately been ascribed to diathesis.

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[1] Laennec calls tubercle a growth, or rather he speaks of the "growth of tubercle," but it is clear that in making use of the word, he intended to express, not that tubercle had any of the characters which we now attach to "tumour," but rather that it had a tendency to increase, that increase being a process of accretion or accumulation—a state of passivity, not of activity.

Those last-mentioned might be disposed of at once according to Buhl,—who says that there is a *constant* dependence of miliary tubercle on pre-existing cheesy products,—did I agree with him as to the facts; but, on the contrary, looking over the post-mortem records at Guy's Hospital for 1868–9–70, I find, of 166 cases of tuberculosis, 80 or nearly half have no mention of any suppuration or cheesy glands, or anything of the kind; and though possibly this proportion is too high, and would be altered if a larger number of cases were collated, still I think some such do occur, and there is no *necessary* connexion between cheesy deposits and tubercle. One no doubt often does follow the other, but I hope to show that a simple inflammation, if continued long enough, will also end in the same way.

It will be found, then, that the cases of tuberculosis in man which come under notice fall into two classes—(*a*) Those in which it coexists with cheesy deposits; (*b*) Those in which it exists alone.

The former class, the one linked more especially with the results of our experiments, may be illustrated by the accompanying cases:—

CASE 2.—William W., æt. 40, came to me as an out-patient when House Physician at Guy's Hospital. He gave this history: That he was in perfect health till four and a half months ago. He was driving a horse which suddenly reared, and his chest became crushed between the shaft and the wall of a house. He immediately brought up some blood and phlegm, and continued to do so for ten days. He was soon afterwards obliged to give up work, and began to waste. Fourteen days before admission he complained of great tenderness over the sternum, which is now hot and uneven, and has all the appearance of having been fractured. He was afterwards admitted an in-patient under Dr Moxon, and died in the Hospital. The account of the post-mortem is an abstract from the Guy's post-mortem records:—

Body much wasted. Sternum separated at the junction of the middle and lower third into two portions, and both ends are carious. There is cheesy or pasty pus extending towards the skin, and collecting there in a subcutaneous abscess. A second abscess was found in the abdominal wall of the left flank. It was encysted, and could be taken out easily. Well-marked tubercular phthisis existed in both lungs, especially of the right. The apex of the right lung posteriorly showed a considerable cavity. The other viscera were healthy.

CASE 3.—Charles S., æt. 45, admitted to Guy's under Mr Poland, in April 1869. The patient is a farmer. His brother died of phthisis. He has always enjoyed good health and is very temperate. For the past twelve months he has had great difficulty in passing his urine, the stream has been very small, and he has passed blood. Complains of no pains in his loins. On 13th April, it is noted that he has a bad cough, and when examined soon after by Dr Fagge, extensive disease of both lungs was detected, with crepitation and consolidation. At the post-mortem the lungs were full of gray tubercle in an early stage, but becoming cheesy. Much cheesy pus was found in the pelvis of the left kidney, with many gray tubercles. Some caseous abscesses existed in the cortex of the kidney.

CASE 4.—Eliza A., æt. 21. Has been married three years. Has had two children and one miscarriage. A fortnight before coming under treatment she began suddenly to increase in size. She felt very ill, and had much abdominal pain. The abdomen was universally dull. The urine was normal, the heart-sounds also. At the post-mortem a suppurating ovary was found, with a general tuberculosis. Numerous recent yellow tubercles were found in the lungs. The abdomen contained a large quantity of thin pus, which distended it much, and the peritoneum was covered everywhere with tubercles of exactly the same appearance as those in the lungs. The viscera were adherent to each other. No ulceration or tubercle existed in the intestinal canal. Many recent yellow tubercles were found in the Fallopian tubes.

CASE 5.—Edward C., admitted into Guy's, 31st March 1869, under Dr Hilton Fagge. From my own report of the case I find that both his father and mother were healthy. No cough or consumption known in the family. He was quite well ten months ago, when he fell down stairs and struck the back of his head. This did not affect him much, and for five or six weeks he enjoyed his usual health. He then fell down in a fit, in which he bit his tongue, and was very livid. He has had an odd manner since, and has dragged his left leg when walking.

At the inspection a large tubercular mass was found in the pons. Outside this mass was a layer of gray gelatinous material, which, from Dr Moxon's report, consisted of a fibrillar and vascular matrix containing faint nucleated corpuscles. The tubercle itself was very firm, like cheese—yellowish, opaque, its outer surface vascular, and having numerous minute miliary tubercles upon it.

CASE 6.—Henry W., 39, admitted into Guy's, under Dr Pavy, in September 1869. He had suffered more or less from cough for eighteen months, and had been drowsy and stupid for a fortnight. When admitted he was comatose, but some phthisical mischief at the left apex was detected.

Autopsy.—An abscess three-quarters of an inch by an inch and a half existed in front of the sternum, opposite the second costal cartilage. The brain-membranes contained much tubercular deposit and lymph. The lungs were adherent by old and firm membranes to the chest-wall at the apices. Large cavities and gray tubercle existed lower down.

CASE 7.—*Miliary tuberculosis of the testis following upon chronic disease.*—Richard C., æt. 56, in Guy's under Dr Habershon, in March 1870. At the post-mortem, made by Dr Moxon, the right pleura was found closely adherent. An old cavity with fibrous induration was also found at one apex. The lungs were stuffed with recent miliary tubercles. The prostate had a large cheesy patch in its right side. The left cord, vesicula, and epididymis were in a state of caseous inflammation, and the corresponding testis had in it a very large crop of miliary tubercles. The duct was diseased to its end in the veru montanum.

CASE 8.—*Yellow tubercle with acute tuberculosis in the brain.*—Jeremiah D., æt. 7, under Dr Wilks in 1870, in Guy's. His friends give no history of any fall. He has had no discharge from the ear. He began to complain of his head seven months ago. The pia mater showed acute tubercular formation, a large cheese-like greenish mass occupied the upper right central part of the cerebellum. It had a pinkish layer outside it.

CASE 9.—*Old scrofulous disease of the testis, with miliary tuberculosis.*—John B., æt. 53, under the care of Dr Habershon at Guy's Hospital. He was under Mr Bryant's care two years ago for disease of the testis. On admission he did not seem very ill, but his temperature was high. His breathing soon became difficult, and physical signs of broncho-pneumonia were found. At the autopsy, both lungs were stuffed with miliary tubercle. Recent tubercle also existed in the pericardium, intestine, liver, spleen, suprarenal capsules, and kidney. The prostate had an abscess in it at the deepest part of its tissue, on the lower aspect of the urethra. The vesiculæ seminales were suppurating and ulcerated. The epididymis in a state of caseous suppuration, and adherent to scars in the scrotum. The testis had many miliary tubercles in it, otherwise it was healthy.

Of the eight cases here detailed, 2, 5, 7, 8, and 9 are perhaps more valuable than the others, as the extension of the disease was more direct, but even in these it is quite open to any one to think that no real extension occurred at all, but that all that was found was the result of a constitutional state. Neither view admits of absolute proof; but on contrasting such cases as those given with the following one, where the disease was produced in a rabbit, probabilities would appear to be in favour of the former hypothesis.

A rabbit was inoculated in the neck, on 7th November 1867, with tubercular sputa. The animal was killed on 18th March 1868, nineteen weeks after the operation. A short distance from the puncture of the injection-syringe a large mass of cheesy material was found, and around the margin of this, spreading away for half an inch into the surrounding areolar tissue, came a large number of small miliary tubercles. No enlargement of the axillary glands had taken place. The lungs contained much tubercular matter, both caseous and miliary. The liver and cæcum also were tubercular. Here, as in cases 5, 7, and 9, acute growth of tubercle was found spreading from the margin of the yellow deposit. Many other cases may, I believe, be explained in the same way, such as the extension of miliary tubercle from an ulcer in the intestine, or the lighting up of tuberculosis secondarily to scrofulous abscess in the kidney, or such as the following when they occur :—

From the post-mortem records at Guy's, No. 87, for 1870. John S., æt. 11, under Mr Poland's care. The right hip was disorganized, and a collection of pus extended up under the pelvic fascia. Death took place from acute general tuberculosis.

How is this extension brought about? Dr Sanderson says, by means of the lymphatic system; and it seems probable that this is so in *many* cases up to the very termination of the disease, and *generally* so up to a certain stage; but bearing in mind that the disease frequently occurs first in the neighbourhood of the vessels, and that when it does, it is generally rapid in its progress and universal in its distribution over the body, I believe that the vascular system also plays an important part in its production. For the further elucidation of this point, it may be as well to call to mind two or three important facts, now, I believe, very generally admitted, and by the mere statement of which the whole process becomes clear :—

1*st*, That cells in the animal just as much as those in the vegetable world will grow and produce successors when transplanted from one place to another.

2*dly*, That cells in a state of over-activity seem to possess the power of inducing a like activity in neighbouring cells. Pus, for example, has this power.

3*dly*, That blood-globules, more especially the colourless ones, have intimate connexions with the surrounding tissues, and probably escape largely into those tissues.

Remembering these points, the history of cases, such as I have given, would probably be such as the following :—

A follicle, of the intestine for example, gets choked with its own secretion just as a sebaceous gland may get clogged, a small ulcer forms as a natural result, and irritant matter is conveyed to the nearest lymphatic glands. This leads to an exaltation of function of the gland, cells are made more quickly, and in proportion to the rapidity of cell-formation within it, is the unstableness of the workmanship, and new cells are sent forth which are but ill matured, and destined to live a more rapid round of existence. These pass into the bloodvessels (it is supposed), and in their turn exert their influence on the tissues. Judging from the way in which the tissues are invaded, I believe they pass out into the surrounding parts, and, growing themselves, produce a like growth in the cells with which they come in contact. Thus, ill formed as they are, their progeny would be fashioned after the same bad model. It seems probable also that this *infection* (truly so called) of the whole system only takes place provided that the gland function be only slightly increased, and somewhat permanently so,—a mere temporary activity doing no harm, while very abundant cell-growth causes a too rapid cheesy degeneration in the gland or centre of cell-formation, and, by blocking it up, for a time arrests the general contamination of the system. In this way we might account for a tabes mesenterica, with but slight or no growth of tubercle elsewhere.

Again, to take an instance of primary infection, such as Case 1. Its history seems to be that active cells—that is to say, cells in a state of transition, on their way to a higher, or, it may be, only a more advanced, development—are injected into, or formed in, a serous cavity. They attach themselves to the moist surface, and either grow themselves or growth is induced by their presence.

The other class (*b*) is made up of all cases of acute tuberculosis, where no existing cause in the shape of pus can be discovered. As a class, it takes in more especially tubercle in the lungs, and it will also include cases of pneumonia, hæmoptysis, and chronic bronchitis, which end in tubercular disease. Strictly speaking, however, this is not a group of which it can be said that pus is entirely absent; but though it may be present, I believe it to take no necessary part in the production of the disease.

As a typical example of the class, and as a somewhat interesting case in itself, I give a short note of a case which came under the care of Dr Rutter at the Brighton Dispensary. I am much indebted to him for his kindness in allowing me to make use of my notes of it.

CASE 11.—George D., æt. 39, a brewer, came to the Dispensary, stating that he was quite well till a year ago; that up to that period he had never had a cough, or indeed any other illness. During his work he strained himself lifting a hogshead of beer. Fifteen minutes afterwards, or thereabouts, he began to spit up blood in small quantity, and this gradually increased with the cough till towards the end of the day, when he brought up a large quantity of blood (he says a quart) at one cough. He continued to spit blood for two days, but has never done so since. A week after the first hæmoptysis, he had much pain in the right side, beneath the right nipple. This lasted some time, with shortness of breath, and even still troubles him now and then. He still has a good deal of cough. His mother died with cough, æt. 40. He is strong and healthy-looking, being robust and muscular. The chest expands feebly on both sides, but more so on the left than the right, and on this side also the percussion note is of higher pitch. On auscultation he has deficient respiration at the left apex, with much submucous rhonchus and stifling of the sounds. The expiratory murmur is rather prolonged and rough. Below the right nipple the ribs are depressed towards the pleural cavity, and there is dulness on percussion. Small sharp crepitation can be heard during inspiration. There is no bronchial expiration. This patch is very localized, being only about three inches in diameter.

Note.—May 1871.—The patient ceased to attend as an out-patient, and on making inquiries for him at the brewery a few days back, I learned that he had become gradually weaker and unable to work, and had just left the town for a consumption hospital in London, but to which he had gone was not known.[1]

Cases such as this are explained by two, I think we may venture so to call them, pathological laws.

1*st*, That, under certain conditions, continued irritation will produce, first, cell-growth in excess, and then, if hypertrophy and nutrition be not commensurate, what may be designated as purposeless growth.

2*dly*, That rapidity of transition from birth to death is in direct ratio to the rapidity of development. Just as a watch with a broken cylinder will run out a length of chain in a few seconds, which, in its sound state, it would have taken hours to accomplish; so, I apprehend, it is with cells. The shorter the period of development, the shorter will be their term of life; and though passing through exactly the same stages as a healthy and well-toned cell would do, they are set to a different time, as it were, the passage between the two poles of their existence being much accelerated. In proportion to the length of time that has elapsed, and the number of generations gone through, will be the divergence of the progeny from the original type, and the less the likelihood of reversion coming into play. Carrying these points with us to the region of tubercle, we may associate them with the following facts:—That in our lungs we possess a large secretory and excretory surface, the cells of which, from the very nature of their occupation, are especially prone to change or hurry in the cycle of their life; and that, under the abnormal conditions in which we live, irritating matter is always present in the air to produce the hurried action. This being so, we might wonder that every one is not tubercular, but that it is evident that Nature has provided us with nicely-balanced powers: thus, a slightly-increased growth is met by a slightly-increased degeneration and absorption. Destroy, however, the balance either by a constitutional state, on the one hand, or an increase of local excitement on the other, and the first law holds good. What is the result? Increased epithelial formation in the first stage, growth of adenoid tissue in the second, and, should the conditions still continue, a regular invading tuberculosis is established—a disease which, if malignancy means anything, is quite as much so as the truest cancer.

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[1] Other cases of the same kind are detailed in the Transactions of the Clinical Society, by Drs Baümler and Herman Weber, 1869, arts. xviii. and xxvi. See also Clinical Lectures on Pulmonary Consumption, by F. Von Niemeyer, Syd. Soc. Trans., 1870. Trousseau also, in his article on Hæmoptysis, says, "Elles appellent vers les organes résspiratoires un mouvement fluxionnaire qui peut déterminer l'évolution d'une phlégmasie plus ou moins dangereuse," etc.

Various collateral circumstances will also act somewhat in determining the extent of pathological change. For instance, in the first stage, or that of catarrhal pneumonia, according as the irritation is applied to an extensive surface or the reverse, and the cells, so to speak, run true or erratically, will be the production of an acute lobar, a vesicular, or a caseous pneumonia. The second stage will depend for its production mainly on two conditions—the *tendency* to cell-change in the patient, and the chronicity or otherwise of the first stage. If the cell-growth is active, a general tuberculosis will probably be established; while, if the exciting causes alone are sufficiently persistent, adenoid formation will also take place to a more limited extent, but without probably any additional stimulus form a constitutional state; I say *probably*, because it would be impossible to demonstrate with certainty the absence of such a state, the strongest evidence that could possibly be brought forward being no more than the negative test, that the disease had not hitherto shown itself.

My belief is, then, that *all chronic pneumonic changes consist in part of adenoid formation.* This view requires corroboration. The only evidence that I shall here offer on the point is, that in five such cases I found extensive thickening of the alveolar walls, with lymphoid tissue, a condition precisely analogous to that of tuberculosis, either natural or artificial, except that the round millet-like grains were absent; and this is probably not a difference of kind, but only of degree.

We must also remember that the ordinary result of a long-standing pneumonia is a permanent induration of the lung from increase of its fibrous tissue, and in connexion with this state, the undoubted fact that miners, stone-masons, or any people living in dusty atmospheres, are frequently affected with chest disease, while after death is found, not a tubercular, but a fibroid, condition of lung. If, in such cases, the earlier condition is, as I say, one of growth in the alveolar walls, the excess of fibre-tissue found post mortem must be regarded as *lymphoid tissue become fibrous*, the corpuscles having all been utilized by the proper tissue of the wall for its own repair and growth. This is the very termination one might expect from a chronic irritation proceeding continually in hardy men. It may be said by those who blame the diathesis rather than local conditions, that tuberculosis is but rarely associated with chronic bronchitis—a class of cases in which, according to the views expressed, it ought never to be absent. That the two are so rarely found together is because the effects of the irritation are neutralized by the emphysema. The ill-aerated blood, and the semi-stagnation in the lungs, are conditions unfavourable to cell-life, and thus when tubercle does occur, it is small in quantity and shrivelled, instead of being succulent and translucent. It is, therefore, named by Dr Moxon "*starved tubercle.*" For the same reason is it, probably, that tuberculosis and heart-disease are but seldom associated.[1]

The third stage of the disease, that of spreading to neighbouring tissues, is well illustrated by the following short note of a post-mortem, made a few months back. The case was one of phthisis. The right lung had its upper lobe stuffed with tubercle; at the outer part of its base a small adhesion, half an inch broad, had formed between it and the upper angle of the lower lobe. At this spot, and nowhere else, was the lower lobe attacked. When examined microscopically, both the lymph which formed the adhesion, and the tubercular lung itself, were in exactly the same state.

But if it is the fact that caseous and suppurating deposits are liable to set up a tuberculosis, we shall find, it may be said, in surgical wards a large amount of such disease. Is this so? Several hospital surgeons have told me that it is not so very common, and this opinion is borne out by post-mortem records, for of 147 cases of joint-disease, with prolonged suppuration, inspected at Guy's during the last seven years, I find only 33, or less than a fourth, were affected with tubercle. Facts, then, are hardly in harmony with theory. An explanation, however, of this discrepancy can be found, but for the sake of convenience it has been postponed till the formation of pus has been considered. Before now leaving this, the first division of our subject, a word must be said on the metamorphoses of tubercle, seeing that upon the opinion which is held with regard to one of these, the formative, will very much depend the value one may be inclined to attach to some of the observations that have been made. These metamorphoses are chiefly two, a formative and a retrograde change. Tubercle has long been called an unorganizable material; but it is truly no such thing: at least, I have been often struck with the fact, first pointed out to me by Dr Moxon, that tubercle may often, when examined microscopically, be seen to merge into well-formed fibre-tissue;[2] and in strong support of this observation comes a fact, the truth of which I think most pathologists will admit, that it is comparatively rare to find a pair of lungs, no matter what the cause of death, in adult persons, with the apices entirely free from either tubercle or an excess of this fibrous tissue. If tubercle is absent, then a certain amount of induration exists alone, while, if it is present, except perhaps in the most acute cases, the two conditions are found together. This bears out and justifies the idea before advanced, that the two products are only modifications of tissue originally common to both.

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[1] Chronic bronchitis does occasionally produce phthisis. Four such cases were lately brought before the Medical Society of London by Dr Andrew Clarke, but they are certainly exceptional.

[2] For observations on a similar change in tubercular omentum, see two cases recorded by Dr Payne in the Transactions of the Pathological Society, vol. xxi., 1870, p. 198. A full statement of Dr Moxon's views on this subject, and the conclusions at which he arrives, may be found in the "Medical Times and Gazette" for 1871, vol. i., in a lecture entitled "Inflammation and Tubercle." Most of those conclusions I believe I may consistently accept, at the same time that I take up a somewhat different position.

The retrograde change is a caseous degeneration which it undergoes like most other cells of animal life. It consists essentially of a breaking-up of the interior of each globule into fatty-looking molecules, and of an ultimate disintegration of the whole mass. It may occur as the result of an atrophic or an inflammatory process.

On turning now more directly to those morbid changes with which the tuberculous state is closely associated, two difficulties arise and somewhat hamper our consideration of them. One is the desirability of avoiding repetition as far as possible; the other, that the extent of ground is large over which the subject ranges. Neither can be completely overcome, for it is impossible to treat the question in any degree fully; and of necessity the details required for the elucidation of the first part have already anticipated much that must follow. Tubercle may be examined from many standpoints; for instance, in its relation to normal nutrition, to hypertrophy, atrophy, inflammation, suppuration, or purposeless growth. Inasmuch as these questions cannot all be discussed, it will be better to contrast it more especially with *the inflammatory process* and its two principal modes of termination, viz., organization and suppuration, and then to notice a few of the many points of interest which appear to link these processes with others which belong to the class more usually designated as malignant or purposeless growths.

It would be well, before setting out on the inquiry, to define our terms; but that, unfortunately, "inflammation" hardly admits of definition, but only of description. I shall here only enter shortly upon that part of it which deals with one of the essential features of the process—the behaviour of the vessels and their contents.

Virchow, in his "Cellular Pathology," lays it down that the products of inflammation are due to the multiplication and degeneration of pre-existing cells, more especially of those of the connective tissue; but the question, "What is it that starts this proliferation?" is the one that more immediately concerns us. Older writers looked upon the whole thing as entirely an affection of the vessels, and divided it into stages, such as hyperæmia with acceleration of the blood-current, hyperæmia with retardation, stagnation, etc. After making three or four such, they came ultimately to that of rupture of the bloodvessels and extravasation of the corpuscles. Waller, Cohnheim, Charlton-Bastian, and others have come forward of late years and shown, from experiments on the lower animals, that there is a free escape of the corpuscles into the surrounding tissues *without any rupture.* The experiments of Dr Norris also rather support this view, and show, perhaps, how the process may possibly be accomplished. Whether there be any rupture or no, however, seems, as far as the result is concerned, to be but of slight importance, save that if it is so, an active agency is shown to be at work, while the mere escape of the globules by means of a laceration might, and probably would, be a passive, and therefore so far accidental, condition. All will then, I think, admit that, either by rupture or migration, the corpuscles get outside the vessels somehow, and this is the great fact to be remembered. Why is it so important ? Because, when considered in connexion with what has been said of tuberculosis, it means the escape of *active* or immature material into a part where it can obtain rest and nutriment—in fact, all the conditions favourable to the perfecting of its development. Of the further stages it may be said, from what I have observed in mice, after injuring the peritoneum, and then killing them by chloroform, that in three or four hours the omentum has many granular corpuscles about it which are not visible in the healthy state. In eight or ten hours similar corpuscles are seen to mingle largely with the adipose collections of the part, the normal cells of which have by this time many of them broken up into numerous small molecules. Later on still, in from twenty-four to forty-eight hours, all the elements of the tissue seem to be in an active state, and what appeared in health to be but delicate lines of connective, now swell out, and become well-marked tailed cells. The process traced thus far may, we know, go on either to organization or to pus-formation. Therefore, pus and formed material may arise from the same elements; and inasmuch as the chief product in an inflammation is cellular, they are probably both formed out of lymphoid corpuscles. That pus consists entirely of lymph-corpuscles escaped from the vessels, I am unable to believe, seeing that such large quantities will form in a few hours, and that similar corpuscles are probably largely formed at the expense of the ordinary fat-cells; neither is there any reason for binding ourselves by such an hypothesis if we recognise the law already referred to, that cells in a condition of hyperactivity possess the power of inducing a like activity in neighbouring cells. Allowing this, it may be said that the inflammatory state has for one of its chief features the escape of lymph-corpuscles into the tissues outside the vessels; that these bodies, from their nutritional activity, immediately proliferate, and by producing a like hurried action in the neighbouring tissues cause the elements of the *whole part*, not themselves alone, to partake in a rapid cell-growth. It is the rapidity which constitutes the disease, and large numbers of immature cells are its product. Since, then, cell-proliferation is common both to organized lymph and also to pus, what is the latter as distinct from an inflammatory product which stops short of suppuration? and how does this differ from the normal nutritive processes? Their respective differences may be illustrated thus:—Cell-life has three stages: 1*st*, One of development; 2*dly*, One of maintenance; 3*dly*, One of degeneration. Further, "there are facts enough to prove that the power which can be exercised in a germ is limited, so that the capacity of assuming the specific organic form cannot be communicated to an indefinite quantity of matter; and there are also enough to justify the expression that the power thus limited is, in some measure, consumed—first, in the development of every new structure; secondly, in less measure in the growth and maintenance of those already formed."[1] Healthy nutrition, then, is growth under certain restrictive influences, whereby only part of the power inherent in the germ is consumed, and energy is still reserved for development. In inflammations in which the product is organizable, the growth is excessive, and maintenance usurps the place of development; the new material is, therefore, of low formation. But inasmuch as the cell excess may vary in quantity in different cases from 1 to ∞, so will the development of the product vary; and inasmuch also as it must be supposed that there is a certain amount of force in all living things over and above that which is actually needed—a reserve force—in slight inflammations, or in robust people, the excess of cells can be fairly supplied with the power required, and thus it happens that the development is good. In suppurative inflammations the growth is in great excess of the formative power, neither development nor maintenance can be carried on, and degeneration, and indeed death, commence even at birth. But, be it remembered, the act of *dying* is not death, and though a cell be on its decline it may still be capable of much mischief; and so, I apprehend, it is with pus.

Now, it so happens that the most common, indeed nearly the sole form of cell-degeneration known, is one of fatty change—each cell becomes full of minute drops of oil, which are afterwards discharged by its breaking up. From this cause all fluids containing such bodies, or even lymph-cells, which have some close connexion with fat-tissue from their earliest formation, when in considerable quantity, have a yellowish and creamy appearance, and have been lumped together as purulent collections. We have thus come to look upon *the thing Pus* as a specific entity, which, when examined microscopically, can be recognised as such, from the fact that it is composed of rounded cells containing eccentric nuclei, etc. Further, having once recognised the presence of these bodies, we say that such fluid with its contents is incapable of passing into more permanent structures or to a higher development. But, surely, this is a most erroneous view; for just as an organizable inflammatory product may vary in its component cells from those which are perfect in form to others which are only just able to hold their own, so is it with pus, which may be anything, from a number of cells with some capability still in them of further existence, to those composed of positively dead material. The fluid being partly produced by the liquefaction of the dead cells is, of course, so far dead; but it does not follow that living corpuscles floating in it must of necessity die also;

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[1] Paget's Lectures on Surgical Pathology, ed. 1870, p. 119.

rather is it, I think, more probable that some might be able to save themselves by the disintegration of the perished ones

The difference, then, between growth, formative inflammatory products, and suppurative ones, is mainly a question of degree—the same process, cell-proliferation, goes on in all; and so long as the part, or the whole body, is able to supply the demands made upon it for these embryonic cells, so long will there be a capability of tissue-formation, but beyond this degeneration and pus-formation will begin. It is no doubt quite true of surgical pus, if I may use the expression, when we see it fresh from an abscess, that much of it is really dead. All I wish to urge is, that what it is now, when evacuated, it was long before, as far as its characteristic cells are concerned, from the instant that they entered on the stage of fatty degeneration; but more than this—at what time each individual cell dies, or when it may be said to be positively dead, there is no evidence to show. It may also be said that, though this fatty change, of which we have been speaking, is more especially prone to occur in lymph-glands or epithelial cells from moist surfaces, precisely the same condition may also occur in all rapidly-growing cells, or in the most highly-organized tissues, as nerve or striated muscle. Having traced the inflammatory process thus far, we may recall to mind that, in speaking of tuberculosis, two modes of onset were described—one by means of the vessels, the other by a direct stimulus to an absorbent surface. And now, again, in inflammation, I have to say that nutritional irritability may probably be brought about by the same two modes, though, strictly speaking, the two should come under one heading, seeing that we have proof only of the escape of corpuscles after the application of some irritant. Alcoholic cirrhosis would seem to supply an example of the first, and pneumonia of the second, form.

If now we compare in the lung the progress of the two diseases, pneumonia and tubercle, we find that, in both, the first stage is excessive epithelial development—that the inflammatory disease, though generally going no farther, may from thence pass on, if it be at all chronic in its course, to adenoid formation, and terminate either in a caseous pneumonia or a fibroid induration, the latter being the more common; while tubercle, always reaching the second stage, may, in its ending, become fibroid, though its disposition is usually towards softening. We may say, therefore, that the two affections, starting from the same point, usually diverge slightly in their course—the one ending in a formative, the other in a degenerative change, but that *both* not unfrequently terminate in precisely the same manner. It is often urged by those who regard pneumonia and tubercle as quite distinct diseases, that the two are antagonistic in their results—that in the one there is almost always resolution, in the other as certainly destruction of tissue; and this objection holds good of acute lobar pneumonia and tubercle. The acuteness of the attack, however, is, at the same time, the explanation of the divergence of results; the duration of the disease, and the danger of tuberculosis, being in direct ratio to each other.

Again, it is said, one always attacks the apex, the other nearly always the base of the lung; but this difference is due, I cannot but think, more to the accident of position than to the nature of the two complaints. The lower lobes are supplied with more blood—they are more directly supplied with the fresh inbreathed air, and the evacuation of the foul air is more complete than in the upper lobes, while the latter are perhaps, in addition, more fully distended and stretched. It is true that such disadvantages are, at most, but slight ones, but, small as they are, they would, on *a priori* grounds, be quite sufficient to determine that an acute disease coming by blood or air should attack the lower lobes; while that a chronic disease, or one that advances little by little, should attack that part of the lung in which the air is slightly less pure, and which is more constantly at work, is also just what we should expect.

The other objection, that tubercle is unorganizable, is, as I have endeavoured to show, not a valid one; still, it must be said, it was partially true of the material which formed the basis of the opinion, viz., cheesy deposit. Such, no doubt, are unorganizable to the same extent that we have allowed pus to be—they both consist in great part of dead material, though by no means necessarily entirely so.

With such views of tuberculosis and pneumonia, it is almost unnecessary to say that the distinction, *pathologically*, between a caseous pneumonia and tubercle seems purely artificial, both being a growth of adenoid material with infiltration of the lung-tissue. In what site it commences, or whether in the earlier stages the epithelial element is more predominant than the adenoid, matters but little, if the results are the same; and I still think that the old view of what is now called caseous pneumonia, that it was a very acute tuberculosis, was anatomically correct, though perhaps clinically it may be of importance to distinguish between the two. While, therefore, the statement of Niemeyer,[1] that "the greatest danger to most phthisical patients is the development of tubercles," is certainly true, I maintain that this seeming paradox is quite as true, that *the great danger in tuberculosis is due to the formation of tubercles.* And why? Because these nodular growths have but little chance of keeping up the nutrition of their central parts, and the probability of softening down is greater than in those cases where each cell is brought into more intimate connexion with the surrounding structures.

On this point Niemeyer even does not seem to have recognised to its full extent the position he has taken up, for, after arguing in favour of "some causal connexion between the tubercles themselves and those nutritive changes in the lungs preceding their development,"[2] he proceeds further on (page 30)—"Indeed, if the doctrine that every case of phthisis consists in tuberculosis were correct, we should be obliged to admit that hæmoptysis could not very well lead to pulmonary consumption, as the exuded blood is certainly not transformed into tubercles." But, on his own showing, hæmoptysis may cause a chronic pneumonia and tubercles develop upon it. It may still then be *possible* "that every case of phthisis consists in tuberculosis."

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[1] Clinical Lectures on Pulmonary Consumption. By F. Von Niemeyer. New Syd. Soc., p. 11.

[2] Op. cit., p. 13.

The close relation which inflammation and tuberculosis bear to each other is further indicated by pyæmia, which is apparently a disease consisting of an exceedingly rapid tissue-proliferation induced by the action of pus. This process may be set up by a simple surface irritation—by a gonorrhœal discharge for example—just as a pneumonia or tuberculosis may from irritation of the lung, or by an old scrofulous deposit, of which the following case is a striking instance:—

CASE 12.—*Caseous abscess in the testis—Pyæmia.*—John S., æt. 26, was admitted into Guy's, under Dr Wilks, in May 1869. He came from Brighton, and had nobody with him. He seemed very drowsy, and all that could be elicited from him as to his history, was that he had had a fit. He had some severe epileptiform attacks while in the surgery. On 15th May he had seven fits, and he died on the 16th, rather suddenly, with a very high temperature.

Autopsy.—Face and neck marked with chronic eczema. The lungs had many patches of early lobular pneumonia. The right vesicula seminalis was in a state of caseous degeneration. The left contained recent greenish pus. The spermatic ducts came through the prostate still containing pus. The left testis was adherent, and on removing it some scrofulous-looking abscesses were cut into. The epididymis was in a condition intermediate between suppuration and softening yellow tubercle. The tubes of the epididymis were large and their walls caseous.

Over the first intercostal space was an abscess in the pectoral muscle; it had no well-defined walls.

Having now briefly reviewed some of the points in the process of inflammation, let us revert for one moment to the question, Why it is that prolonged suppurations do not so very commonly end in tuberculosis? I pointed out earlier in the paper that lymph (or at any rate exudation) corpuscles, which are closely allied to them, seem to form at the expense of the normal fat-cell. Whether they do so or not, however, is not of much consequence here, if we admit, as I think we must, that the pus-cell, or any degenerate cell, is only a lymphoid body highly charged with fat. Tubercle also is allied to the normal lymph-cell or a degenerate one, according as its development is good or bad. Practically, it is often much the same as a pus-cell, *quoad* its fat, from its earliest formation. Both pus and tubercle therefore feed upon the same material, if they both require adipose tissue for their production; and it is likely enough that if a large suppurating surface is present, draining away the fat, tubercle would have a difficulty in procuring material for its growth. On this point my own impression is, though I cannot at this moment lay my hands on facts to support it, that the spare, the lanky, and ill-formed, as a rule, have a more chronic form of phthisis than do those who are strong and well nourished; and further, when once the latter get accustomed, so to speak, to the emaciation produced by the disease, they may linger on for indefinite periods. All this, however, is in direct opposition to the clinical history of such patients, which teaches us that they do better on cod-liver oil and on a fat diet than on any other plan of treatment. I am, however, by no means sure that fats are suitable to *all stages* of the disease indiscriminately. It is possible that even harm may be done in the early stages of tuberculosis by their administration, while later on, when emaciation has proceeded to any extent, by their beneficial action on the general health they might react in a manner favourable to the patient upon the growth of the disease.

As to the connexion of scrofula with the maladies of which we have been speaking, it was formerly held, and is still, I believe, by many distinguished pathologists, that the scrofulous and tubercular are distinct diatheses. The facts and experiments enumerated here afford but little support to such a distinction. On the contrary, the scrofulous temperament is pre-eminently a caseous or suppurative one, and it has been my endeavour to show that caseation and tuberculosis go hand in hand. As to Virchow's definition, that tubercle arises from proliferation within the connective tissue, while scrofula is a glandular affection; allowing that the distinction is a real one, which it would not appear to be if the result of such proliferation may be gland-formation, it is yet true that one may give rise to the other, and if so, can they be distinct diatheses?

We have next to notice a few facts which would appear to indicate that malignant growths are possibly not very far removed from those affections of which we have been speaking—that they are apparently offshoots from the same stock, and in their progress subject to the same laws as have already been laid down.

First, then, what has been said of inflammation and tubercle, as regards their causation by external or local irritation, may with equal truth be applied to purposeless growth. Thus, continued stimulation will produce hypertrophy, then warts, and then, in some conditions, epithelioma.

It may be again enforced that *time* is an essential element in the process. If the excitement be but temporary, the cell progeny speedily returns to its former normal type; should it be continued longer, but still short of that moment at which malignancy begins, the tendency is still to revert, but the time that must elapse between the cessation of the irritation and the re-attainment of the former pattern is proportionately increased; while in epitheliomas, the tendency to work back again is not noticed at all. Such growths are then characteristic in their infiltrations, or in the power they possess of modifying the nutritional force of neighbouring cells. But this case of epithelioma may be said to be a special one. Taking therefore the more general one of scirrhus or encephaloma, we find that they are of more frequent occurrence in the glandular epithelial organs, such as the breast and testis, and that, if the tumour be obtained in its earliest growth, the disease may often be found to attack principally the epithelium of the tubules. I have noticed this particularly in scirrhus of the breast; when not occurring in epithelial organs they are found in glands which are ever in a condition of activity, and consequently in a state of change. An apparent exception to this rule is found in the frequency with which bones are attacked by medullary cancer, but it is not really an exception; for, according to Dr Sanderson,[1] within the last few years abundant adenoid material has been found in the medulla of bones.

2dly, It is probable that a truly cancerous growth may commence in the lymphatics around the vessels as with tubercular disease. At least, this result seemed to have occurred in a patient whom I had an opportunity of examining, who died of cancer of the liver, associated with tubercle in the peritoneum. The tubercle was not what is ordinarily understood by that term. They were millet-like grains, which, when examined microscopically, were found to consist of structureless collections of cells in all stages. The earliest condition was one of growth in the lymphatic channels, others had in addition the same kind of corpuscles clustered immediately outside the lymphatic wall, which varied in number up to regular cancerous tubercles. In connexion with this case may be mentioned another of soft cancer of the lung in the Museum of the Sussex County Hospital, at Brighton, a note of which I have copied from the catalogue of specimens, by Dr Ormerod's kind permission :—

"D. 43.—Encephaloid disease of the lung, taken from a patient who died of malignant disease commencing in the lumbar glands, which subsequently became as large as hens' eggs. All the lymphatics were found infiltrated with cancerous matter. The spleen was scarcely at all enlarged. During life all the symptoms of leucocythæmia existed, white cells being detected in the blood in great abundance."

3dly, It is possible that malignant growths may be transplanted from one part of the body to another. An instance of this mode of production is recorded in the Transactions of the Pathological Society,[2] by Dr Moxon.

To strengthen further the position that cancerous growths are largely the result of local causes, may be mentioned the clinical fact that such growths are often attributed to blows received, and though such history may be vague and unsatisfactory, it ought not,

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[1] Recent Researches on Artificial Tuberculosis, in their relation to the Pathology of Phthisis. Edinburgh Medical Journal, Nov. 1869.

[2] Vol. xx. p. 28. 1868–69.

I think, to be entirely set aside. Again, the time of life at which scirrhus of the breast most frequently appears (40 to 50, according to Birkett;[1] 45 to 50, according to Morrant Baker[2]), and the fact that 77 per cent. of such cases are or have been married,—these seem to suggest that the gland, having now no safety-valve in secretion for its declining force, takes on an erratic action. It is also to be noted that of 91 cases oberved by Mr Paget, 56 were in robust or good health at the time of the first appearance of the tumour, 9 others were in good health, and only 16 sickly.[3] Mr Birkett, however, in his article just referred to, could arrive at no definite conclusion as to the state of health when the tumour was first noticed.

If, then, tubercle, inflammatory products, and cancer, may each and all be produced, either by a local irritation or erratic development on the part of the ordinary lymph-corpuscle, in what do they differ from one another—for this they certainly do widely, both pathologically and clinically? In answer to this question, it can only be said, that they differ in the life-history of their ultimate particles. Thus, malignant growths possessing a large surplus of force expend it entirely in reproductive processes, while inflammatory cells and tubercle have a disposition to distribute what they have in tissue-formation or an approach to it. The more rapid the act in each case, the less perfect will be the work done, and the more likelihood of the occurrence of a degenerative change or a caseous transformation. Other conditions will also come into play, such as the habit of the patient, the situation of the diseased part, the degree of irritation, the extent of surface upon which it is exercised, and the blood-supply to the part, whether copious or otherwise; these, again, will modify in each the result, and, in place of formed tissue or active growth, produce pus or give rise to a process of withering.

Nothing has been said of what are called innocent tumours, because, from the standpoint we have taken, such growths are much more nearly allied to the normal structures of the body than either pus, or tubercle, or cancer *as we see them.* It can only be said now, that, inasmuch as they are abnormal only by position, or the predominance of one particular tissue over another, they fall quite properly into the class of hypertrophies.

The question of multiple growths, or those in which two or more different tissues foreign to the part are found in any one organ, as enchondroma and encephaloid disease in the testicle, are not so easily dealt with, though the difficulties are such as may possibly be explained when considered in connexion with what has been put forward in this paper.

When inquiring into the nature of these morbid products, the question of *tendency* on the part of the patient has of necessity been often raised. It will not be out of place now to say that, while arguing on the side of an extrinsic factor *in all cases*, it is at the same time admitted that this would be as nothing without a soil in which it could germinate. What I wish to suggest is, that instead of using the term *diathesis* in a limited sense, as proper only to a few, it should be made universal in its application, and only variable in degree. This diathetic condition I suppose to be a proneness on the part of the whole organism, or of single cells, to degenerate by a too rapid rate of living. Believing this, I cannot think that there is any habit of body in which it would be *impossible* to produce a tuberculosis, any more than that there is one in which an inflammation could not be set on foot, while in both cases the production of disease would be infinitely easier of accomplishment in some people than in others.

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[1] Diseases of the Breast, in Holmes's System of Surgery.

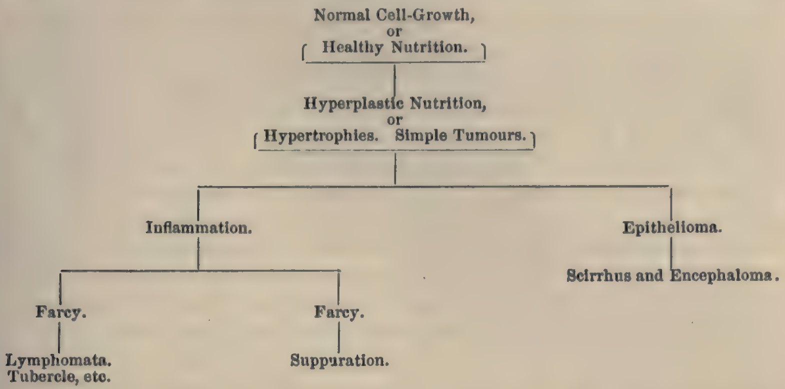
[2] Contributions to the Statistics of Cancer. Medico-Chirurg. Trans., vol. xlv.

[3] Op. cit., p. 638.

But, it will be said, if you acknowledge a certain tendency, and allow that it exists in some persons more than in others, you admit an unknown quantity into your calculation, and leave us very much in the position in which we were before. Is this so? Must we not, if we acknowledge the necessity of a combination of conditions for the causation of disease, allow also that, by modifying or removing one factor, we render inoperative the action of the other? and, if so, is not a hitherto very hopeless class of cases brought more nearly into the region of the preventible?

Whether we shall ever be sensible enough as individuals to believe this, and by acting on our belief endeavour to keep dust and smoke and all other abominations from giving us tuberculosis, remains still to be proved.

In conclusion, I have thought it advisable to draw out a table which will perhaps aid in explaining more clearly than is done in the text the gist of the whole essay. This is merely as a matter of convenience. By so doing, I do not mean to imply that any scheme, however wide in its extension, is so comprehensive as to embrace all cases occurring in actual practice. On the contrary, while attempting to classify, one of the chief objects of my paper has been also to urge, that we cannot always isolate the diseases of which it has treated, and say *this* is certainly tubercle and *that* pneumonia. There will come intervening tracts whose ownership is doubtful; and it is by these intermediate links we learn a true pathology. Possibly, some whose opinion I much value may think any attempt at classification a step in a backward direction;—let me then remind such that one of the best of our living authors has said, "When it once comes to thinking, good-bye to anything like strict agreement amongst men." Until then, all doubtful points have been reduced to matter of fact; and scope is no more left for inquiry, so long is every one who honestly thinks his conclusions based upon sufficient premises entitled to his own opinion.



It now only remains for me to thank the members of the staff at Guy's Hospital, and Drs Ormerod and Rutter of Brighton, for having so kindly placed their cases at my disposal. Without these the paper would have been valueless.

ARTICLE III.—*Suggestions as to the Use of Calabar Bean in Cholera Asiatica.* By W. MUNRO, M.D., C.M., District Medical Officer, St Kitts, W. I.

FROM the near approach of cholera to England, any reasonable suggestions for its cure will not, I hope, be considered out of place. For some time past I have thought that Calabar bean would probably be useful in cholera; but living in an island that has not for the last seventeen years been, and I hope will not for a still longer time be, visited by the disease, I have not had, and am not likely to have, an opportunity of giving it a trial. I have therefore adopted the somewhat unusual course of putting forward a drug for a new use on its *a priori* merits, hoping that any medical man who, like myself, from a consideration of these, is induced to believe that it is likely to prove useful, and who has the advantage of being able to make a trial of it, will communicate his success or non-success for the benefit of the profession. The fact that on *a priori* reasoning it is likely to do good, must be my apology for trying to add to the number of medicines which have already been vaunted as specifics in this disease, and failed on trial. Whether the cholera poison kills by acting directly on the blood, or on the vaso-motor centres of the spinal cord through the blood, causing contraction of the small arteries and capillaries of the skin and congestion of the internal organs, there can be but little doubt, I think, unless in the minds of those whose great specific is castor-oil, that whatever counteracts the effects produced by the poison will be useful; and this, I think, considering its physiological action, Calabar bean is likely to do. In Cholera Asiatica the temperature of the surface of the body is diminished, while that of the rectum, and probably of the viscera, is elevated,[1] the capillaries in the first case being contracted, in the other dilated, probably from some irritation of the vaso-motor centres of the spinal cord. The action of Calabar bean is to cause dilatation of the smaller arteries and capillaries, and this Dr Fraser "is led to believe is mainly due to a specific effect on the ganglia and nerves which govern the calibre change in the vascular system;"[2] and "it causes paralysis of the spinal cord by a special and primary action."[3] At first, no doubt, there is for a short time contraction of the vessels, but this is probably caused by the restriction in the heart's action.

"The Calabar bean, acting on the bodies of mammalia in a state of health, *expands the capillaries and slightly elevates the temperature of both skin and rectum*;"[4] and it might be advanced that the benefit conferred by its causing dilatation of the peripheral vessels in cholera would be counterbalanced by its effects on those of the intestine. As, however, the dilatation of the vessels in the intestinal mucous membrane seems to be rather the effect of the contraction of those of the skin than a primary effect of the poison, it is highly probable that if the bean restored the former to their natural calibre, as it probably would, the latter remaining to a certain extent in a state of dilatation, if they did so, would be of no consequence, as they would no longer be in a state of congestion, and would be better able to retain the serum of the blood, the loss of which is so serious.

Physostigma increases the secretions,[5] probably as an effect of the dilatation of the vessels. If the ideas given above are correct, however, it would not have this effect on the abdominal secretions in cholera.

"It seems in the first place to increase the vermicular contractions of all the abdominal viscera, and then diminish them."[6] This action would probably tend to lessen the purging and vomiting.

That it can act as a counter-poison to poisons having so far an action analogous to cholera, is shown by its causing dilatation of the minute bloodvessels when they have been contracted by atropia.[7] Dr Fraser has found that it is an antidote to strychnine,[8] and it has been used with success in tetanus.[9] It would therefore, it is more than probable, even were it useful in no other way, relieve, perhaps even remove, the frightful cramps of cholera, the pain of which, by its depressing influence on the system, assists so materially in destroying the patient.

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[1] See Niemeyer's Text-Book of Practical Medicine, translation by Humphrey and Hackley, vol. ii. pp. 640, 641.

[2] *Vide* Fraser in Transactions of the Royal Society, vol. xxiv. p. 53.

[3] Ibid., p. 20; and see also Fraser in Edinburgh Medical Journal for June and December 1867.

[4] Ibid., p. 54. [5] Ibid., p. 73. [6] Ibid., p. 57. [7] Ibid., p. 67.

[8] Page 26, Exp. xliii.

[9] See, for instance, Dr Macarthur, in Edinburgh Medical Journal, May 1867.

As to *when* the bean ought to be used: This, I think, could be best judged of by the medical man, according to circumstances; but, as far as I think at present, I would be inclined to use it whenever I found that the premonitory diarrhœa was not stopped by ordinary remedies, and that the external temperature was lower than normal by the thermometer.

As to *how* to use it: I would give it by subcutaneous injection. In Dr Macarthur's case mentioned above, it was so given, and no bad results followed; but even were some local inflammation to be set up, if the patient recovered through its use, that would not much matter. I would inject in the dorsal region of the back, beginning with ⅛ gr. of the extract, repeated every two hours, and increase the dose if required. It is well said by Dr John Murray,[1] "In collapse, experience shows that opium astringents and alcohol lie inert on the collapsed stomach," and I have no doubt extract of Calabar bean would do the same.

I need perhaps hardly say, that I would by no means trust to Calabar bean alone, but would use such rational means (as, injections of salt and water, sinapisms, and heat applied externally) as have been found of benefit.

In conclusion, I would beg it to be understood, that what I have said is simply to be taken as suggestions for the use of a drug which, I think, is *likely* to prove useful in cholera, not as proof that it necessarily must be so; indeed, if at all recklessly used, it might be very mischievous, from its great depressing influence on the heart's action; and I would earnestly advise those of my readers who are in a position to do so, to read over Dr Fraser's papers referred to above, before using it.

ARTICLE IV.—*On Feigned Diseases, their Detection and Management.* By GEORGE WILSON, M.A., M.B., C.M.; Medical Officer H.M. Convict Prison, Portsmouth; late Medical Officer H.M. Female Prison, Woking; and Assistant-Surgeon H.M. Invalid Prison, Woking.

IN the experience of most general practitioners, malingering, or the feigning of disease, is happily of such rare occurrence that but very little attention is devoted to a study of the subject. Cases, however, crop up now and then even in the most select of practices, and many, I have no doubt, on account of their comparative infrequency, remain undetected. The medical attendant, unsuspicious of any motive to deceive, is naturally puzzled with the anomalous symptoms presented by such a case; he tries all sorts of remedies, becomes eventually chagrined because the cure is protracted, and attributes to the failure of his art the unsuccessful issue of a disease which in this instance did not exist. One is so loath to believe that the sick-bed should be made the arena of deception, that rather than yield to suspicions even though they be well founded, we sometimes fall back upon the complexity of disease, the uncertainty of diagnosis, and end by giving the scheming patient a good deal more than the benefit of the doubt. Hence it is that club patients occasionally make capital out of their clubs, that paupers mulct the parish unduly in the way of relief and extras, and that persons, after receiving handsome damages for a railway accident, often recover with a rapidity which is truly astonishing. Every medical man therefore is, to a certain extent, the custodian of public justice and morality, and in so far as he fails to detect such fraudulent attempts which come under his notice, so far does he fail in discharging efficiently the trust reposed in him.

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[1] In the British Medical Journal, 12th August 1871, p. 177.

Perhaps amongst no class of individuals, not even amongst soldiers, is malingering practised with such skill and persistency as amongst convicts; and this is not to be wondered at when we consider the low *morale* of the class generally. "Be civil and take it easy," is the motto of the habitual criminal during his imprisonment, which means simply that a man has a perfect right to his opinions, provided always he keeps them to himself, and that his duty is to do as little as he possibly can in the way of work without running the risk of being reported, or, if the work becomes too severe, to "shirk" it by any expedient which he can adopt. Formerly, when pardons were granted on medical grounds, the temptation to malinger was considerably greater than it is now, though even now the arduous work and scanty diet of a hard-labour prison render the convict's life distasteful enough. If, therefore, he is put to work which he does not like, he considers it quite fair to sham any illness in order to be recommended to lighter work, to gain admission into hospital, or if possible to become invalided and sent to an invalid prison. Sometimes, again, he feigns insanity, that he may have a chance of being removed to a criminal lunatic asylum, or be enrolled amongst the imbecile prisoners.

Naturally, the code of criminal ethics is so very liberal and elastic, that scheming and duplicity are not only deemed quite legitimate, but the convict who excels in such qualities deserves well of his fellows, provided always he treats them honourably, or, in other words, does not play the part of spy or informer. Hence it seldom happens that the surgeon receives any information relating to a case of malingering from other prisoners; and if he does, the chances are that any such statement would turn out to be a falsehood. Under these circumstances, he has to depend on his own acumen, with whatever aid he can obtain from infirmary warders in the way of observation.

It may be inferred from these remarks that very little reliance can be placed on what are called the subjective symptoms in cases of doubtful illness amongst convicts. Indeed, so much is this the case, that the prison-surgeon, after no lengthened experience, becomes very sceptical concerning such symptoms unless they are confirmed by objective signs of disease. I confess it is not a pleasant feeling to be constantly influenced by this sceptical turn of mind, for it is apt, unless carefully kept in check, to lead one into mistakes; nevertheless, it is the most effectual safeguard against being imposed upon, and I cannot help thinking that a little of it would tend to lessen the number of glaring discrepancies which are too often observable in the medical evidence given before a civil court in cases of railway accidents. Although I have personally had no experience of such accidents, I feel quite sure that if subjective symptoms were as closely scrutinized as they are in prison, the damages which railway companies are made to pay would be materially lessened. No doubt, a hysterical woman, or a hypochondriacal, nervous man, would be very liable to suffer after a railway accident from symptoms characteristic of what has been called "railway spine," even if no actual injury beyond a good shaking has been received; yet though these symptoms are only imaginary, they are very distressing to the patient, and do not in the least impugn his good faith. Hence, in all cases of railway or other accidents claiming damages, it would greatly assist in forming a correct diagnosis to adopt the system which one is induced to pursue in prison—namely, to inquire minutely into the previous history and character of the patient, and to discover, if possible, the existence of any motives for deceiving. It would be well also if the parties sued for damages had the power of refusing compensation to doubtful cases, unless they submitted to be put under observation in an hospital or elsewhere.

Without attempting to follow any formal classification of feigned diseases, I shall now proceed to point out in detail some of the more common phases of malingering, illustrating by cases derived from prison experience and other sources. And first with regard to feigned injuries and diseases of the spinal cord. Cases of this description are of great importance medico-legally, because they are of such frequent occurrence after railway accidents. The form of disease, or rather symptom of disease, most usually simulated is paraplegia, and though the mode of detection and management must necessarily vary according to circumstances, it may be of some interest if I describe briefly a typical case of the kind occurring in prison practice, and how it is dealt with:—If, for example, a prisoner receives a fall on the works, and has to be carried into the hospital on a stretcher, complaining of great pain in the back and inability to move his legs, but with no loss of sensation and without any signs of local injury, his statements are carefully noted, though left open to question. It is possible he may have received a spinal injury, and as it is always best to err on the safe side, the patient is put under observation, and treated as if the case were genuine. Meantime inquiry is made into the criminal history of the patient, which is fully detailed in his caption-paper, as to his conduct, as to whether he has been previously convicted; whether he has been frequently reported for idleness, or whether he has ever been charged with malingering on any former occasion. The evidence of the officer in charge of his party is also obtained, who furnishes the particulars of the accident. Next morning the night-officer reports as to how the patient slept, and whether or not he observed any movement of the legs. If now it be found that the urine and fæces are passed without any difficulty, that the pulse is normal, that the temperature of the legs is not lowered, and sensation is still intact; if it be found, also, that the fall was not of such a height as would be likely to produce serious injury to the spine, and that the prisoner is just the sort of person to make the most of such an accident,—the case looks very much like one of malingering. As a confirmatory diagnostic test, a pin or the point of a lancet may suddenly be thrust into the leg, when the limb in all probability will be flexed with an amount of violence and to an extent which cannot wholly be explained on the theory of reflex action. A dose of the galvanic, or of an electro-magnetic, battery will complete the cure, and the prisoner is discharged and reported.

Simple though the diagnosis of such a typical case may appear to be, it is necessary to take all these precautions, and to guard against hasty conclusions, because a mistake at the outset may readily be made; and to my mind there is nothing so painful, on after reflection, as to discover that one has unjustly suspected a poor fellow who has really been injured. The following is an instance of such a mistake. One morning I was called hurriedly to see a prisoner who had fallen from a scaffolding. The scaffolding was only between six and seven feet from the ground, and the prisoner had fallen backwards on his shoulders. He was complaining lustily of pain in his back; but as the extent of the fall appeared so trivial, and as my faith in prisoners' statements was considerably shaken by that time, I concluded that he was making the most of it, and rather harshly told him so. He was carried to the hospital, and placed in a separate cell for observation. On examination, no external sign of injury could be detected, but the patient complained of great pain in the lower dorsal region, of numbness, and a pricking sensation in the legs, and of being unable to move. In the evening he had retention of urine, and the catheter had to be used. The ultimate history of the case was one of ordinary paraplegia from injury to the spinal cord. Complete loss of sensation set in; in a few days the urine became ammoniacal, and the retention was gradually replaced by incontinence. At first enemata had to be used, but afterwards the fæces passed involuntarily; the temperature of the legs became lowered; there was gradual wasting, succeeded by extensive sloughing, and the patient died twelve weeks after the injury was received. Post-mortem examination showed that the portion of the cord corresponding to the ninth, tenth, and eleventh dorsal vertebræ was disorganized and converted into pus, and that the body of the tenth vertebra appeared to project slightly backwards. No doubt, there had been effusion of blood into or round the cord, in consequence of slight dislocation and fracture.

Even in severe spinal injuries it is quite possible that there may exist complete loss of power without appreciable loss of sensation, according as the afferent or efferent tract is affected. Only a short time ago I saw a case of this kind, not connected with the prison. A workman had fallen backwards from off a timber cart, alighting, as it was stated, on the back of his head. He was insensible for about ten minutes, and when conveyed to the surgery where I saw him, it was found that he had a slight contused wound on the occiput; but he was unable to move his legs or arms, and could only grasp one's hand with the feeblest pressure. He could move his head from side to side, and had no loss of sensation. The breathing was not noticeably diaphragmatic, nor could there be discovered any external signs of fracture or dislocation of any of the cervical or upper dorsal vertebræ. Had he been a convict, I believe I would have regarded the case with some suspicion; as it was, the surgeon who attended him very properly had him removed to hospital. I have since learned that he died in a week afterwards, the paraplegia remaining, but without any marked loss of sensation. No post-mortem examination was made.

I mention these cases to show how inadvisable it is to form a rash opinion, even in cases which, at first sight, may not appear very serious. Of course, a few hours' observation, or a second examination, would settle the diagnosis in the great majority of severe spinal injuries; but every fresh case has peculiarities of its own, and if these peculiarities present themselves to us in the light of anomalies, we are apt to become puzzled, and, perhaps, over-suspicious. It has also to be borne in mind, that delineations of symptoms in text-books, however full and accurate, cannot include the varied features of every case.

But in most instances of feigned injury to the spinal cord, the paraplegia, which is generally the only prominent symptom, is a sort of after-thought; it sets in gradually, and, as a rule, is limited to the legs. A person, for example, has sustained a fall or received an injury of some kind, and, on examination, abrasions or contusions may be found in the dorsal or lumbar region. The patient complains of great pain in the back and of stiffness. He may also have numbness and "tingling" in the legs, arising from concussion. He is put to bed and nursed carefully. His appetite is good; there are no febrile symptoms, and no retention of urine. By-and-by the bruises disappear, and when it is thought the patient may get up, he says his legs are nearly paralyzed, and he cannot stand on them though he can move them in bed. Here, then, is a case in which there was undoubted injury to the back and perhaps concussion to the cord, but nothing further; and it takes no small amount of tact and discrimination sometimes to decide positively its real merits. If the patient is a resolute fellow, he will stand any amount of blistering along the spine—will even submit to an application of the actual cautery without giving in; and should he maintain that he has loss of sensation, will not wince at the thrust of a pin or lancet.

As an example of cases of this description, I quote the following from a paper published by Dr Hall, of Sheffield, in *The British Medical Journal*, 21st March 1868, on Railway Accidents:—

"Mr ——, a gentleman in middle life, had the misfortune to be riding in a second-class carriage at the time of a collision on a railway. After the accident he proceeded some distance; and, at the end of his journey, he was seen by the surgeon of the company. He complained of pain over the dorsal and lumbar regions, on which, he said, he hâd been bruised; and, in addition, of an inability to walk without pain. He returned to his home from London in a first-class carriage, was immediately attended by his family surgeon, and was seen by myself, for the first time, seven days after the accident.

"I found him in bed, laid on his back. He told me 'he was suffering very great pain along the whole course of the spine, and that he had not power to move his legs, or even to turn in bed.' The temperature of the whole body was normal. He had perfect command over the bladder and rectum; he said that at first he had 'difficulty with his water, but that was improved.' His pulse was 76; but as he spoke of the severe injuries he had sustained by the negligence of the company, and the heavy damages (two or three thousand pounds) that he would make the directors pay, he became very excited, and his pulse to rose 98. On getting him out of bed, he was unable, he said, to walk, or to bear any of the weight of the body on his feet; he supported himself by the table, and insisted on being again carried immediately to his bed. There was no mark on any part of the back. During the whole of my attendance these symptoms remained. He complained of a sensation of pins and needles in both legs; there was no reflex action; no drawing up or starting of the legs; no wasting. As we saw him in bed, he appeared a stout healthy man, but told us again and again, 'that he had no power over his limbs, and that he was unable to walk.' In the absence of all objective symptoms, I ventured to express a very strong opinion that no permanent injury to the spine or spinal cord had been sustained; and in this opinion three other medical gentlemen concurred. Having satisfied myself that not only could he walk without assistance, but that he had actually done so, and that, too, at the time when he assured me that he was altogether incapable of moving his limbs, I discontinued my attendance.

"A gentleman of great skill and long experience was now called in, and, through trusting to subjective symptoms only, he was led to conclude that the injury to the spine and spinal cord was severe, and probably permanent.

"About three months after the accident, the case was compromised, by a payment by the company of several hundred pounds. It is, doubtless, a consolation to this gentleman and his friends now to know that my prognosis was correct, and that his and their fears proved altogether groundless. Shortly after the case was settled, he was observed walking about in the street. He has almost ever since attended to his business; and no trace of the injury remains."

Occasionally, paralysis is feigned by convicts who have been admitted into hospital, and are being treated for some other ailment. As an instance in point, I give the following case:—Prisoner G. D. was admitted into hospital 25th February for debility. He had lost a good deal of flesh, having been employed at hard labour, and said he felt dizzy when at exercise. His appetite was good, and he was put on liberal diet and tonics. Although he continued to improve in appearance and to gain weight, he himself would never admit that he was any better. On 22d March, the night-officer reported that he had a fit of some kind. Next day there was nothing unusual in his appearance. His appetite had all along been good, and he could give no satisfactory explanation of how the fit came on. He was told that he was making rather too much of it; he took the hint, and has had no more fits since. But a few days afterwards he complained of soreness in the legs, and said he could not walk properly. When asked to walk, he went tripping along, taking short rapid steps, and without allowing the heels to touch the floor. Although I could not think so, it was quite possible that this might be some strange and insidious form of locomotor ataxy, and I therefore examined into all the features of the case as carefully as I could. I found the temperature of his legs normal; sensation normal; no wasting or flabby state of the muscles; no ocular disturbances; the urine normal. He could stand with his eyes bandaged; and, when asked to walk, tripped along as he had done before, keeping his arms extended to prevent his falling or knocking against anything. He could even shuffle backwards. The officer also told me that he could carry his urinal to the water-closet with both hands, and that, at these times, he walked much better than when exhibiting during the visit. Being satisfied as to the nature of the case, he has been treated to a daily application of an electro-magnetic battery, to which he submits apparently with the greatest resignation. Finding that this did not succeed, I applied Corrigan's cautery along the spine, so as to produce a series of small blisters, and these have been kept open by ung. sabinæ dressing. In spite of all this, he daily maintains that he is "much the same—no better and no worse." He looks well, takes his food well, and sleeps well. I have told him my opinion of his case, and have ordered an ordinary galvanic battery, which, in my experience, is far more suitable for such cases, because more powerful, than the electro-magnetic. I expect that a few doses from the new instrument will produce a rapid cure. If it be asked, how is it possible that a prisoner would submit to all this if there were not something the matter with him? the answer is that, in this case, the prisoner detests work, and is an old malingerer; in the second place, he would like to be invalided; and, thirdly, he is afraid of being reported and flogged when he is discharged from hospital. All these are sufficiently powerful motives, without taking into consideration that spirit of dogged determination common to almost all cases of malingering amongst convicts, which prompts the schemer to persist to the utmost verge of endurance, for the simple reason that, in being obliged to give in, he loses caste amongst his fellows, and is liable to be reminded of his failure oftener than he likes.

But when a prisoner, by feigning paralysis, has succeeded so far as to escape detection, and is at last removed to an invalid prison, the case presents itself in a new aspect. In the first place, the prisoner has been invalided because his disease was believed to be genuine; but beyond the mere statement of the cause of invaliding, no detailed history of the case is forwarded. The surgeon has, therefore, to trust to the patient's own account of the commencement and progress of the disease, and to the conclusions which he himself may arrive at after a physical examination. If he has doubts concerning the exact nature of the case, he is averse to communicating frankly with the surgeon who has invalided the prisoner, because he could not expect the latter to entertain his opinion at any rate until he has proved it to be correct; and, indeed, we all know that the evidence must be clear and conclusive before any one would admit that he has been caught tripping in this way. Fortunately, however, a great assistance to diagnosis may be obtained from a well directed cross-examination of the patient, especially if the questions be put in a sympathizing tone. He has gained the end for which he has intrigued so long and perseveringly, and consequently he is more or less off his guard; but if from look or remark he gets the least inkling that he is suspected, he forthwith retires into his shell of reticent caution, and no amount of coaxing will get him out of it again. If he can be got out at all, it will only be by having recourse to forcible ejection, and sometimes that is no easy matter. The cross-examination must, therefore, be conducted in the kindliest manner, and so as to give the patient the impression that his credibility is unquestioned. By a process of what may be called inferential interrogation, he will very probably be induced to give a very incongruous and contradictory account of his case, and will usually admit that, thanks to the "skill and kindness of the doctor" who invalided him, "his life has been saved, and he has even improved a good deal lately, but he never expects to get well again." Indeed, his expressions of gratitude to all and sundry would be as gratifying as his quiet resignation, were it not that the one is as hollow as the others are false. It will also be found that distasteful remedies such as blistering or galvanism, if they have been tried at all, did him no good; in fact, they made him worse. Any improvement in his health that has taken place has been entirely owing to the generous diet which the doctor was good enough to give him, and to the medicines which he so skilfully prescribed for him; thereby giving you to understand that if you adopt a different course of treatment your professional reputation is at stake. And so the interview ends. If the case is clear, he may either be assured that you have no doubt he will soon get well again, because you have seen other patients get cured whose condition was much more hopeless than his; or he may be flatly told that he is a malingerer, and the sooner he gives it up the better. If the latter course be adopted, there must not be the slightest room for doubt in the case; and one must also be fully satisfied, from judging the character of the patient, that he will yield readily to prompt and legitimate measures. As a matter of expediency, therefore, it is advisable, in the majority of cases, to humour the patient a little, and to assist him in getting well, deferring the opinion entertained of his ailment until some considerable advance towards cure has been attained. He may even be allowed the aid of crutches for a few days, and the luxury of an easy-chair; but if the indulgence is protracted, one cannot be surprised if he takes such a liking to these articles that he will not readily give them up.

When assistant-surgeon to the Woking Invalid Prison, I saw a good many cases of this description; but with the exception of individual idiosyncrasies of character, they were all very much alike in presenting little or no physical changes indicative of disease beyond the paralytic symptoms. And here, lest I might be charged with reflecting on the professional acumen of my brethren connected with the convict service, I would honestly state that it brings no discredit on them to have been deceived by such cases; nor does it imply a greater power of discrimination on the part of any one, under whose care they came, to have detected them. Medical diagnosis has not yet reached that point of perfection when it can be said that he who makes a mistake is not *well up* in his profession; and I fully believe that our most accomplished physicians would be liable to be duped occasionally if they had convicts for their patients. I have already said that malingerers, when they are invalided, are less on their guard, and are even desirous to be freed from some of the irksomeness attending the sick-bed, that they may enjoy as much of the amenities of the hospital as possible, while taking great care not to lose them altogether. For this reason they are much more open to detection, in the same way that children afford far better opportunities to judge of their characters when on a visit to a friend's house than when at home, especially if they are naughty children. This illustration may appear to be unscientific, but it is none the less pposite.

Sometimes, however, prisoners do not throw off the mask so readily even after they have succeeded in being invalided; and when this is the case it is found that they have in prospect either a remission of part of their sentence or final liberation on medical grounds. Dr Campbell, Medical Officer to the Woking Invalid Prison, who has had extensive experience in the detection of invalided malingerers, gives the following instances of this species of feigning in his annual report for the year 1869. He writes:—"Feigned paralysis of the lower half of the body has often come under my notice, but two remarkable cases occurred this year. The first met with an injury in September 1866 in prison, which was said to have been followed by complete paralysis of the lower half of the body, and continued up to the time of reception in June last. He then appeared perfectly helpless, pretended he could not turn in bed without assistance, and that he could not retain his urine. His behaviour was at the same time very insolent and discontented, constantly reflecting on those he had previously been under, and threatening us here when anything was attempted for his benefit. He was placed under close observation, and the usual remedies for the disease employed in a firm but gentle manner. On the sixth day after reception he got out of bed, and on the tenth, when we went to the ward at the usual hour to galvanize him, we were rather astonished to be told that he had gone down to the exercising yard with the other patients. This quick recovery from paralysis of about three years' duration is sufficient to show that whatever may have been the immediate effect of the accident, he must at all events have been feigning for some considerable time. Failing in this, he tried to feign epileptic fits, asked to be removed to a cell, and allowed a bed on the floor, which was refused; and on being closely watched, he soon desisted.

"Another, received in apparently the same helpless condition, deceived us for a considerable time; but by steadily persevering with the treatment, he suddenly regained the use of his limbs, and walked to the bed he had so long occupied in a seemingly helpless state."

A case of the same kind was received at this prison last year for transmission to an invalid prison. His paralysis, he said, was the result of an accident, but he had lately got so much better that he could sit out of bed and move about a little with the aid of crutches. When spoken to, he affected a sort of paralysis agitans of the head, otherwise his appearance was very healthy, the legs well nourished, and the sensation and temperature normal. There was no incontinence, nor was the urine unhealthy. He resisted the galvanic treatment for a time, but at last we came to a mutual understanding; he was reported to the Visiting Director, and has since been employed on the public works.

When such cases as these occur amongst female prisoners the diagnosis becomes much more difficult, because they are liable to be confounded with hysterical manifestations or with functional paralysis. The following is a case in which this difficulty arose. A prisoner, about 40 years of age, was received into the Woking female prison with paralysis of one leg. On examination, I could not detect any difference between the two limbs, but the patient said she had no feeling in the one that was paralyzed. In spite of this, however, I concluded that it was a case of shamming, and suddenly thrust the point of a lancet into the leg, expecting of course that the limb would be suddenly flexed. But I was deceived; there was no movement of the limb, and the patient only gave me a reproachful look when she saw a little blood trickling from the puncture. From this I changed my diagnosis, and put it down in my own mind as a case of so-called functional paralysis; and believing that galvanism would really prove beneficial, I used the battery daily with apparently very marked benefit. In a short time the patient could move about without a crutch, and one day during the visit she fell down on her knees in the ward, and showered down her blessings on me, just as only an Irishwoman can, for having saved her from being a life-long cripple. All this, though somewhat stagey, was nevertheless gratifying, for the woman had been a cripple for a long time previous to reception; and though she still dragged the foot when she walked, I was in hopes that in a short time she would be completely cured. In a day or two afterwards, however, she misconducted herself in the ward, and had to be reported; after which she became so noisy and violent that she was removed to a separate cell, and it was considered necessary to put her in a strait-jacket. I was very much astonished when informed next day that she had struggled out of the jacket, pitched it out of the cell-window, which she had smashed, and finished by dancing Irish jigs with a vigour that soon put her out of breath. When I asked her to account for her conduct, she told me that the "Blessed Virgin" had appeared to her in a vision and cured her. At any rate I received no more of her blessings, but something the reverse, when I explained to her my opinion of her case. She several times afterwards refused to get out of bed, maintaining that her leg was again paralyzed; but, whether rightly or wrongly, I as invariably reported her for malingering. In fact, she was an incorrigible, though I have sometimes thought since that possibly it was not all feigning on her part.

Paralysis of a limb, unless it arises from actual injury to the nervous supply, is of such rare occurrence, that in the absence of any objective symptoms, any case of the kind ought naturally to arouse suspicion. I believe it has often been feigned in the army, but, with the exception of the above somewhat doubtful case, I have met with no other instance amongst prisoners.

In intimate relation with this part of the subject, there is a class of diseases primarily or ultimately affecting the spinal cord, which, in military or prison practice, are liable to be regarded at the outset as feigned;—I refer to chronic diseases of the cord or its membranes, and to caries of the vertebræ and lumbar abscess. Acute spinal meningitis and acute myelitis are attended by symptoms so well pronounced that, whether their diagnosis be differentiated or not, no doubt could arise as to the existence of serious active disease. But when these affections are chronic, the train of symptoms sets in so insidiously and indistinctly that there is great difficulty in making a correct diagnosis even in cases which are beyond the range of suspicion of being influenced by any motives to deceive. The possibility of the occurrence of such cases has always to be borne in mind by the prison-surgeon, and, consequently, he has to be very cautious in deciding upon the merits of any case presenting symptoms, however ill defined, that could be attributed to the commencement of one or other of these diseases. With regard to caries of the vertebræ or to lumbar abscess, these remarks are doubly applicable, because while the incipient symptoms are as obscure, the diseases themselves are of far more frequent occurrence. I have myself seen two cases, one of caries of the cervical vertebræ, and another of caries of the lumbar vertebræ associated with lumbar abscess, which were at first regarded with a considerable amount of suspicion; and in military reports there is abundant evidence to show, that not only have such cases been sometimes regarded as fictitious, but have even been treated as such.

I think it may safely be laid down as a rule that in all cases of shock or possible injury to the spinal cord, a favourable prognosis may be given so long as the symptoms remain purely subjective, and, indeed, where there exist any motives for exaggeration or deception, the absence of all objective symptoms ought to arouse suspicion. Paraplegia resulting from accident, unless it be of a hysterical nature, is speedily followed by symptoms of a more or less grave character. If the seat of injury be situated above the fifth cervical vertebra, the whole of the limbs are paralyzed, and dyspnœa and difficulty of deglutition are intense. If the injury is below the second dorsal vertebra, the arms are not affected, but the intercostal muscles are paralyzed and the respiration becomes diaphragmatic, thereby rendering sneezing, coughing, or deep inspiratory and expiratory efforts impossible. But whether the seat of injury be in the cervical, dorsal, or lumbar regions, the healthy functions of the bladder are more or less interfered with, the urine becomes eventually ammoniacal, and the sphincter ani is relaxed. When the injury is severe, the temperature of the paralyzed parts becomes lowered, the muscles waste, the cuticle desquamates, and bed-sores are formed. Sensation may or may not be lost. These are the more important objective symptoms attending disease or injury of the spinal cord, and they cannot be lost sight of when we have to decide as to whether a suspicious case of the kind is feigned or not. The safest and most legitimate means of detection, as I have already indicated, is a free use of the galvanic or electro-magnetic battery, along with strict observation. I have twice tried chloroform, but the patients objected so strongly, and became so violent at the outset, that I did not like to run the risk of putting them sufficiently under the influence of the drug, there being a possibility, in their excited state, of some untoward accident arising.

(To be continued.)

ARTICLE V.—*Case of Deformity of the Pelvis, in which Cæsarean Section was performed; with Remarks.* By ANDREW INGLIS, M.D., F.R.C.S. Edin., Professor of Midwifery in the University of Aberdeen.

THE subject of the operation which I am about to detail was living at Kintore, about 14 miles from Aberdeen—a dwarf 3 feet 6 inches in height—who, having arrived at the full period of pregnancy, fell in labour, and, after having been waited on for forty-eight hours by a midwife, was seen by Drs Laing and Abel, who immediately acquainted me with the fact. On my arrival I found the pulse pretty good, but was told that it flagged considerably at times. The skin was in good condition and the tongue moist, while there was little abdominal tenderness. The vagina was cool and moist, with the usual viscid mucous secretion tinged with meconium; and the os was flaccid and dilatable. The breech was attempting to present, but the inlet of the pelvis was so small that only a portion of the nates could be felt, the œdematous scrotum of the child nearly filling the pelvis. The sacro-pubic diameter at the brim was easily reached, and seemed about 2 inches long, while all the other measurements of the pelvis were more or less diminished. As craniotomy with such a presentation would have required to be preceded by evisceration, and would therefore have been much more dangerous for the mother than cæsarean section, we determined to perform the latter operation.

Having ascertained that the placenta was on the right side of the uterus, the line of incision chosen was on the left of the mesial line. The patient having been put under chloroform—of which, however, not much was required during the operation—the knife was entered about 1½ or 2 inches to the side of the umbilicus, and carried down for about 5 or 6 inches, but farther progress in that direction seemed unadvisable, as the superficial veins were large and tortuous in the lower part of the abdomen. The incision, therefore, was extended upwards for about 2 inches. Two small veins at the lower angle of the incision bled, but were secured by torsion. A flannel dipped in hot water and wrung-out was laid over the incision and held till all oozing ceased, and then the uterine incision was made. The knife was entered at the fundus about 1½ inches to the left of the mesial line, and was carried first downwards and then to the side, the curve of the incision corresponding with the direction of the outer circle of fibres surrounding the left cornu.

Before the incision was begun the uterus seemed so thin and membranous that the outlines of the child could be felt, but, on the slightest touch of the knife, contraction came on, and the parietes became so thick that I feared at one time I was on the placenta. During the cutting of the uterus the bleeding was pretty profuse, two large vessels going across from the left side to the placenta having been divided, and the patient was almost in a state of syncope.

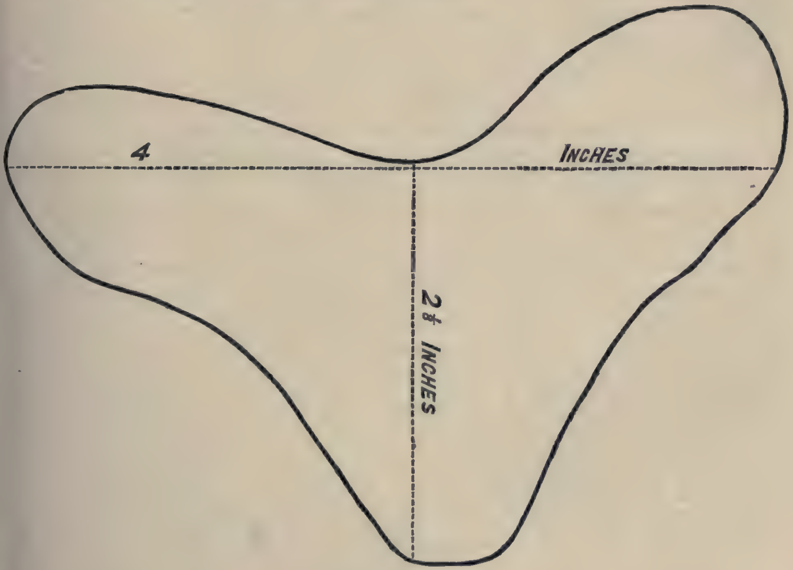
Having finished the uterine incision, it was enlarged slightly with the finger, and then the hand was introduced, the head and body of the child turned out, and the placenta peeled off and expelled; and, finally, two fingers were pushed down through the os, after which the uterus contracted strongly and expelled the hand. At this stage of the operation a portion of the colon protruded, but was easily returned. The flannel was applied again for a short while, the abdominal wound being kept open, but the air excluded; and, after that, when the uterus was well contracted and the bleeding had stopped, the parietes were sewed up and a pad and binder put on. After this the patient took nearly an hour to rally before we could venture to put her to bed, but when there she began to improve; vomiting had been severe before the operation and returned again a little, but an hour or two after delivery she brought up a large quantity of slimy mucus, which gave her great relief. There was also some bleeding per vaginam, which was stopped by a little ergot. She had a tolerably good night. Dr Laing saw her in the morning, found the pulse about 120, temperature good, tongue moist, and no vomiting; had passed urine freely by herself several times. The abdomen was not very tender to touch. Next day Dr Abel saw her, and gave a similar report. She had passed a good night—not much pain—but was bringing up now and then mouthfuls of bilious matter. This in part he attributed to her immoderate drinking of cold water.

The following morning the symptoms of shock increased, and on our arrival we found her dead.

The child was alive before the operation, and when extracted breathed once or twice, but could not be resuscitated.

Post-mortem Examination.—Drs Leslie and Abel of Inverurie, and Dr Laing of Skene were present at the autopsy. The body was well nourished and in high muscular condition, the thighs and upper arms being very thick and firm. The forearms and legs were also very strong, while the hands and feet were small and childlike. The femur was 9 inches long, and the leg from the knee to the sole of the foot 9 inches, the arms being proportionally short. The head was large and hydrocephalic-looking; the body was very thick and the spine straight, except at the lumbar region, where the last vertebra joins the sacrum. At this point there was an acute angle formed between the spine and sacrum, and externally the pelvis looked small and ricketty. The other bones were also more or less affected with the same disease, as shown by the curving of their shafts and the thickening of their epiphyses. On removing the binder and pad the abdomen was found to be tympanitic, and the incision quite disunited; the upper stitch, which was made where the abdominal walls were almost membranous, had given way with the retching, but the pad had prevented the viscera from protruding. No lymph had been poured out at any part of the wound, and when the wires were cut it gaped, allowing the bowels to escape. They were healthy-looking, but slightly distended with flatus. No signs of peritonitis could be traced, and there was only a small black clot in the pelvic cavity.

The uterus, which had been small and well contracted immediately after delivery, had relaxed; and the incision, which after the contraction felt quite small, had regained its original length, and was filled up by a large black clot.



At the brim the conjugate diameter, after the uterus had been removed, was 2⅛ inches long, and the transverse close to the sacrum 4 inches, the recess on the left side of the sacral projection being larger than on the right. At the outlet the tuberosities of the ischia were 3 inches apart, and the pubic notch was coarctated, while the axis of the outlet was in the same straight line as that of the brim and nearly quite horizontal.

Remarks.—There is little room for comment on this case, for it resembles in so many points numerous others that have been recorded. For instance, the style of deformity is so ordinary, that I have in my museum two pelves exactly the same in form, but rather larger, and both of the women from whom they were taken were delivered by cæsarean section. Moreover, the patient, as often happens in such cases, was too long ill before being seen by a medical man; and, though the pulse was apparently good when the operation was begun, still there had been now and then marked flagging of the heart's action, and symptoms of threatened collapse. Afterwards, the want of a skilled nurse, and the injudicious management of her friends, did perhaps even more harm than the length of the labour.

As to the manner of performing the operation, I ventured to deviate slightly from the usual mode of proceeding.

Abdominal Incision.—In the first place, though the abdominal incision was as nearly as possible perpendicular, it was made several inches to the side of the middle line, so as to get into the thickness of the rectus muscle. The reasons for adopting this line rather than the linea alba are as follows:—In dissecting the abdomen about the full term of pregnancy, it will be found that the increase of its forward capacity is due almost entirely to the expansion of the central tendon between the recti muscles, the fleshy portions being pushed to either side without undergoing expansion to any extent. The expanded tendon is very thin, and is covered by little more than the skin externally and the peritoneum internally. If one examines the abdomen of a woman newly delivered, it will be observed that the recti muscles come back nearly to their original places; but when she moves or coughs, this loose portion of the parietes between them bulges out and shows its form, and also it can be pushed quite into the abdomen between the contracted muscles. In few women does this space ever regain its former shape or rigidity. The objections to an incision through such a structure are, that it is too mobile to be easily kept in apposition; the stitches also must be near the edge to keep the raw surfaces together, and if so, are liable to get burst when the patient moves; plaster will not stick to it when it is slack, and there is too little surface to pour out enough of lymph to have good adhesion. In this case, the incision accidentally at first was begun too near the middle line; but whenever this was noticed, the knife was swerved slightly to the side into the thicker part of the parietes, and at the post-mortem examination it was seen that all the stitches had held except the one at the top, which was in this attenuated membranous space.

Against the incision between or close to the muscular fibres of the rectus, one objection only can be urged, and that is, that the epigastric artery or some of its branches may be cut; but such an accident would neither add to the patient's danger nor increase materially the difficulty of the operation.

Uterine Incision.—In the history of the post-mortem appearances of the uterus after unsuccessful section, we find two forms of gaping of the wound in that organ, each having a distinctly different cause.

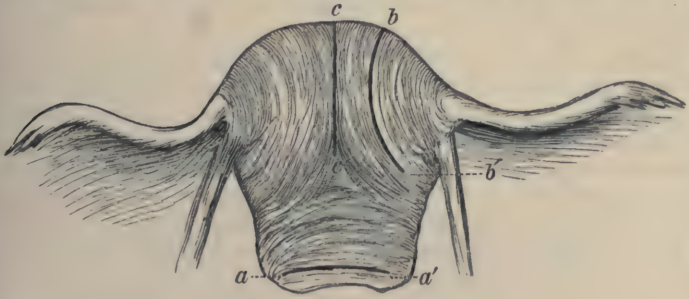
The first form is the passive one, where the wound gapes from end to end, as was found in our case. This arises from the relaxation which usually occurs in newly-delivered moribund women who are dying from collapse. At the post-mortem of such cases I have often seen the uterus lie loose in the abdominal cavity, just as if that organ had been artificially emptied after death; and yet, in these cases, the uterus had contracted after delivery and stopped the tendency to post-partum hæmorrhage some time before the relaxation came on, so that the uterus, being entire, was found to contain little or no clotted blood.

Under such circumstances, this gaping is rather to be considered as a symptom of the mode than a cause of death.

The other form of gaping of the wound is an active one, from normal contraction of muscular fibres that have been cut across. If the patient survives the primary dangers of the operation, and much muscular fibre has been divided transversely, the portion of the wound which does not cross the fibres often heals, while the other portion remains actively open, discharging the uterine secretions into the peritoneal cavity, and causing fatal peritonitis. To avoid this, two means may be adopted—namely, judicious selection of the line of incision, and sewing up of the wound.

To accomplish this by means of the former, there are several lines which may be selected as the best according to the circumstances of the case; for, on account of the situation of the placenta, nature of presentation, etc., it may be more convenient to incise one portion of the uterus than another. A consideration of the arrangement of the uterine muscular fibres will, therefore, give us an idea how to avoid cutting across more muscular tissue than necessary.

Whatever be the ideas held as to the ultimate disposition of these fibres, consisting in all of three layers, the greatest bulk of them is found to run in nearly concentric curves round the three different orifices of the uterus, and thus, on the anterior surface of that organ, are three places where an incision can be planted without fear of active secondary gaping. The first of these (*a*, *a′* in the diagram), a transverse incision across the neck of the uterus as low down as possible without injuring the bladder, was recommended by Dr



Johnson[1] and approved of by Dr William Hunter, but has never, so far as I can ascertain, been tried; but, I have no doubt, where the head projects well over the pubes, making the lower part of the uterus tense, that it would do remarkably well, provided the placenta were out of the way. Were the placenta right in front of the body of the uterus no other line of incision would suit so well. It is also the least vascular and thinnest portion of the uterus, so that if ligatures and sutures were used they could be easily extracted afterwards per vaginam.

Next to the transverse wound near the cervix is the line of incision (*b*, *b′*) adopted (apparently for the first time) in this case. The knife was entered about an inch and a half to the left side of the mesial line, and at the very top of the uterus—that is to say, within the circle of muscular fibres which surround the Fallopian tubes of that side, and it was continued curvilinearly, in accordance with the run of these fibres, as far as could be managed; so that, while active contraction was under observation, neither bleeding nor gaping took place, and also, an hour or two after the operation, the wound must have still held together when post-partum hæmorrhage came on, seeing that there was profuse vaginal discharge without bleeding into the peritoneal cavity.

A vertical incision (*c*, *c′*) in the middle line sometimes succeeds, but failures often happen where the incision, at first agreeing with the parting of the two sets of Fallopian circles, has been carried down too far and run across the transverse fibres surrounding the lower aperture of the uterus. A reference to the diagram will explain these lines of incision.

As to sutures, I have great doubts about their advisability, for the uterine structure at the full period is remarkably friable after a long labour, and tears too easily the moment a solution of continuity is effected. If these stitches be put in, and the usual post-partum swelling takes place (and it does so in proportion to the amount of muscular exertion spent on the labour), the threads or wires would almost certainly cut themselves out, except, perhaps, at the low transverse line of incision, where the substance of the uterus is too thin to swell much.

In conclusion, though these views as to the manner of performing cæsarean section are appended to the history of one case, they are not hasty conclusions suggested by this single performance of the operation, but were arrived at some years ago after a long and careful study of the literature of the subject, and after having made many dissections of dead pregnant and puerperal women; and nothing met with during the course of the operation has induced me to alter my preconceived views concerning it, except with regard to some minute details.

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[1] R. W. Johnson. New System of Midwifery. Second edition. 1786. P. 308.

Part Second.

REVIEWS.

Manual of Human and Comparative Histology. Edited by S. Stricker. Translated by Henry Power, M.B. Lond., F.R.C.S. Vol. I. 8vo.

This handsome and most interesting volume forms another of those valuable contributions to science published from time to time by the New Sydenham Society. The idea of translating it, we are told in the preface, originated from a consideration of the remarkable paucity of works on this subject in the English language. Surprising as such a state of matters may appear, there is nevertheless no denying the fact. Most of the detached treatises on the subject which do exist are either incomplete as compendiums of histology, or have been written at a time when the methods and means of observation were very far behind that perfection they have recently attained. It is, therefore, with much pleasure we bear testimony to the concentration of knowledge presented in this work, and the able manner in which it has been originally edited by Professor Stricker, and subsequently translated by Mr Power. The plan of the book is that adopted in many other well-known works in medicine. The subject is divided into departments, in each of which a different author contributes a separate monograph; while to every such section is appended a list of most or all of the known authorities in connexion with it. Many excellent woodcuts illustrate the subjects described; and as the translation and printing occupied only eleven months after the appearance of the original publication, it may be said to comprehend the latest advances made in histological knowledge. An introductory chapter discusses the general methods of investigation employed by modern histologists. The chief instrument at our disposal for the examination of the finer *structure* of the various organisms is of course the microscope. But, besides their structural arrangement, a knowledge of the vital properties, and the phenomena exhibited by living tissues, has of late become an acknowledged and most important branch of microscopical research. Alluding to this subject, we find in this chapter the following remarks:—

"The technical methods of research applicable to these two subjects are nevertheless different. When we desire to follow, and ultimately to modify, the vital processes under the microscope, other means of research are required than when we merely wish to acquaint ourselves with the forms of the elementary parts. Moreover, experiments which are performed under the microscope differ according to whether they are conducted on living or on dead bodies. The sensitiveness of the former to external influences, makes—even in the microscopically small compass of the instrument, and bearing in mind the management necessary for its use—experiments possible under circumstances which are not practicable in the case of dead tissue. Thus we find that changes can be induced in living tissue by slight variations in temperature, by feeble currents of electricity, and by weak solutions of acids; whilst the operation of these agents must be much more energetic for the purpose of experiment on the dead body, and this is not always agreeable for the observer, nor suitable for the more delicately constructed instruments. The greater sensitiveness of the living organism demands proportionate delicacy in its treatment, but at the same time facilitates experiment; and to this we may ascribe the circumstance that experimentation on the living body has gained so much in value during the last few years, that is, during the period that the investigation of living tissues has been so extensively undertaken."

Passing to the subject of cells—perhaps the leading subject in histological research—we find an elaborate and comprehensive although brief résumé of the various theories held from time to time on this matter, and a somewhat exhaustive inquiry into the modern views existing in respect to these organisms. The word "cell," however, seems to be unfitted in its usual acceptation for conveying the idea attaching to it at the present day. Indeed, it is somewhat difficult to state, much less to demonstrate with precision, the exact differential characters distinguishing and separating the cell of Max Schultze—the unenclosed mass of protoplasm, with a nucleus—or that of Brücke (the same, without a nucleus) from the "isolated fragment" of such tissue, to which the name of cell appears to be denied. It would be a change for the better were some other term adopted here than that originally employed to designate the vesicular structures so described in the time of Schwann and other earlier investigators.

An interesting although rather abstruse chapter follows, on the much-discussed subject of connective tissue. It would be out of place attempting here to epitomize the whole gist of this chapter; but as some difference seems to exist in the construction put upon the term by different authorities, we may quote the definition here given:—

"It has become customary in histology to associate together a series of tissues under the term connective tissues. From these tissues all those portions of the animal body are formed, which can be regarded in the most general significance of the terms as the basement membrane, supporting layer or investment for epithelial structures, blood, lymph, muscles, and nerves. In the Vertebrata the group of connective substances includes connective tissue, cartilage, bone, the tissue of the cornea and dentine.

"The connective tissues are developed from the middle germinal layer, in which blood and muscle also originate. The typical connective substances are recognised histologically by the circumstance that they contain extensive and continuous layers of material (intercellular substance), which, when compared with the cellular structures distributed through its substance (protoplasma), or the morphological elements in other tissues, always appears as a more passive substance, and one which participates but slightly in the processes characteristic of life. These masses consist for the most part of gelatine-forming substances, such as collagen, chondrogen, and ossein. The connective tissues frequently pass by substitution or genetic succession into one another; they appear therefore to be morphologically equivalent; so that in many instances certain organs, or parts of organs, belonging to animals nearly allied to one another, are formed sometimes of one, sometimes of another of these tissues. . . .

"A series of various forms of tissue must be included under the term connective tissue. This name was originally given in 1830, by Johann Müller, to the tela cellulosa of the older anatomists; but as at that time observers had already convinced themselves that this tissue is essentially composed of very fine fibres, which may be proved to be the chief constitutent of tendons, ligaments, membranes, and other formed portions of the organism, all these tissues, together with the tela cellulosa, were included amongst those portions of the organism which are composed of connective tissue. Formerly, however, the description of this tissue was limited to a fibrous form of the tissue, possessing very definite histological and chemical characters.

"This limitation has, however, been greatly extended by custom, and just as, in consequence of their functional agreement and continuity of substance, a series of microscopically different structures are combined under a common term—as muscle, nerve, etc.—we are on similar grounds led to a general application of the term connective tissue, and to distinguish its several forms. Amongst the microscopic morphological constituents thus distinguishable in connective tissue may be enumerated cells; networks and trabeculæ, developed from cells, consisting of peculiar delicate unbranched fibres (connective tissue fibrils), for the most united into fasciculi; and, lastly, fibres which are differentiated from those above named by the resistance they offer to the action of acetic acid and alkalies, by their repeated division, by their forming networks, and by their fusing into lamellæ (elastic fibres)."

The minute anatomy and structural characters of special tissues —nervous, muscular, glandular, etc.—occupies the greater share of the remaining portion of the volume. The special organs themselves—the tongue, stomach, spleen, heart, intestines, etc.—are each elaborately discussed; and, in dealing with them, most or all of the more recent researches are given, with full and copious references to the authorities quoted.

Perhaps the subject of spectrum analysis scarcely falls under the province of histology, and this may account for certain recent researches in this department of physiology being passed over in the otherwise copious and exhaustive article devoted to the blood. In conclusion, we must specially advert to the admirable monograph by Waldeyer on the Structure and Development of the Dental Tissues—a subject on which as yet no standard work of reference, in regard to their morbid anatomy and pathological conditions, seems to exist, but which want is ably compensated, to a certain extent, by the knowledge here afforded of their physiological peculiarities.

As a work of reference, however, on all it treats of, we can cordially recommend the volume before us. The translation, as already stated, is only about one year behind the original, and it is expected that the second volume will be issued still more quickly —being promised in the autumn of the present year.

Some Remarks on Diabetes, especially with reference to Treatment. By WILLIAM RICHARDSON, M.A., M.D. London: H. K. Lewis: 1871. Pp. 122.

SUCH is as yet the obscurity prevailing in regard to the treatment of diabetes that any remarks on it are most eagerly listened to, not the less when they are commenced by the significant statement that "ten years ago" the author was attacked by the disease.

A personal feeling in regard to the disease ought to be a sufficient guarantee for the trustworthiness of an author's statements, though not certainly always of his reasonings; and if we were certain that the author would take our remarks in good part, and endeavour to aid us in ascertaining the truth, a book such as that now before us would be worth criticising line by line, especially as he tells us that he has not only cured himself, but many others, by a faithful and patient carrying out of the system advocated. The author commences with a history of the various theories of diabetes. The earlier and purely chemical theories as to the origin of this disease possess little interest for the profession nowadays. With Claude Bernard in 1848 our modern views commence. He proved, as was supposed conclusively, that sugar was a normal production of the liver, and therefore an exaggerated performance of its normal function the proximate cause of diabetes—an exaggeration of function which the effects of artificial lesion of the fourth ventricle led him to believe might depend upon disordered innervation. In 1860, Dr Pavy disputed Bernard's conclusions, while fully admitting the accuracy of his experimental results; that is, he admitted that sugar was certainly to be found in a dead liver, but asserted that it was never present during life, its production being prevented by the influence of the nervous system. Schiff, Jaeger, Meissner, etc., confirmed Dr Pavy's views, and aided in propounding what has been termed the "theory of ferments"—a hypothetical substance analogous to "diastase" being supposed by Pavy to be always present in the blood, but prevented from acting by nervous influence till after death, or in diseased conditions, when the amyloid matter of the liver was changed by it to sugar. Schiff believed that this diastase was never found in the liver in the normal state, but that it was found in the blood generally after death, or even only after temporary or partial obstruction to the circulation, such as may be produced by putting a tight ligature round a limb. The diastase, according to him, may be formed anywhere, but it only becomes efficacious in the liver, which is the passive centre for the formation of sugar. The glycogenic function of the liver seemed to be doomed, when, in 1868, Dr Flint, sen., of New York, came to the rescue with an ingenious solution of the difficulty, viz., that the liver contains no sugar during life, because the mass of blood passing through it washes out the sugar as fast as it is formed; while after death, or when the circulation is in any way interfered with, the transformation of glycogenic matter into sugar still goes on, and the sugar being no longer carried off can then be detected in the liver. This he attempted to prove by first verifying the fact, that no sugar is to be found in a liver rapidly removed from a living animal, and then showing its presence in the blood of the hepatic veins after tying the vena cava above and below these veins. This operation took sixty seconds to perform, and Dr Pavy's retort was, that so rapidly is sugar formed in the liver after death that "the result was to have been expected, considering the expenditure of time involved in applying the ligatures."

At this epoch Prof. D. T. Lusk, of New York, stepped forward, and by catheterizing the heart through the jugular vein during life, obtained a good supply of hepatic blood, largely diluted with the comparatively non-saccharine blood of the vena cava; this he compared with blood obtained direct from the jugular vein as affording a fair sample of ordinary blood—non-hepatic in its origin. The result was, that the blood from the right side of the heart was found to contain from two to four times as much sugar as that from the jugular vein; and from this, of course, it falls to be concluded that the hepatic blood contains a by no means insignificant comparative amount of blood previous to its dilution with the blood from the vena cava. Therefore, it seems we can no longer doubt as to the glycogenic function of the liver, which, instead of being merely an organ for the production of bile, seems actually to be a huge manufactory of sugar and urea, from which the bile trickles off as a comparatively insignificant, though by no means unimportant waste product. Indeed, there is nothing perhaps which proves more conclusively how little we know as to the uses of our organs —as to practical physiology—than a comparison of the views hitherto entertained as to the functions of the liver with those now dawning upon us. But even after we have acknowledged the pre-eminence of the liver in the glycogenic function, what a hiatus still remains before we can in any degree understand the production of diabetes, or how it is to be cured! Turn where we may, the fable of Curtius for ever meets us as an inevitable fact. Everywhere around us are yawning gulfs, which, perhaps, not even one life's work will close; but how few are willing to leap into the abyss; yet there lies true fame.

Our author has not got beyond Flint; he has never heard of

Cantani, who, acknowledging the glycogenic function of the liver, and also the heat-producing power of sugar when burned in the lungs, and who, finding, with Balthazar Forster, that diabetics possess all an anormally low temperature, was led to theorize—what seems scarcely a theory—that the sugar or glucose thus formed could not possibly be a true glucose; he therefore termed it paraglucose, and supposed there was something in its composition which prevented its combustion in the body,—which must be true, or all our combustion theories must be wrong. Cantani thereupon set about supplying the body with something which could take the place of sugar in producing heat; this he proposed to do by giving lactic acid pretty freely, as an intermediate product between sugar and carbonic acid—one likely, therefore, to be capable of being burned in nature's laboratory. The results, Cantani says, he has attained are something remarkable; and we may say that the results we have attained by this treatment have been also remarkable,—though, for want of a properly constituted physiological institute, we can only indicate them as sequences of the treatment, and not definitely claim them as results. Besides, however, supplying the body with lactic acid to burn, Cantani takes every precaution to give the erring organ rest.

Richardson divides the disease into three stages: in the first of which a restriction of the amylaceous food is sufficient to cause a complete disappearance, or, at all events, a great restriction, in the amount of sugar passed; in the second stage, sugar is formed even from the cellulose of the animal food used as diet; while in the third it is formed from the tissues of the patient himself. The first being of course the most curable stage of the disease; the second, a stage in which palliation, rather than cure, is possible; and the third, one in which palliation alone is possible. In these divisions Cantani agrees, for sugar of course substituting paraglucose; and all that we have seen of this disease leads us to acknowledge the correctness of this view. Under all circumstances, the lactic acid improves the condition and temperature of the patient; under some, it seems the nearest approach to a cure we have yet seen. Diabetics resemble epileptics, in so far that almost any change is beneficial; with this exception, that in epileptics the interference must be vigorous, and may be anything, while in diabetics the change must be cautiously conducted, and in some theoretically right direction. Any man with a very large experience and a predilection for bromide of potassium, for arsenic, opium, or soda, will soon collect a certain amount of favourable statistics, but will as certainly exclude a larger amount of statistics unfavourable to his views. What amount of truth may be in Cantani's views we know not; but a system of treatment equally successful in young persons with a diabetes of short standing, and in older patients ill for longer periods, must have some foundation of truth in it, which it is desirable to inquire into.

Dr Richardson believes that diabetes is always a functional disease, and therefore curable. We wish we could agree with him. His treatment consists mainly in the administration of iron and chlorate of potass, with alkaline baths and regular exercise, with a high recommendation of the Tunbridge Wells and the Vichy water. He cautions against long journeys by diabetic patients, and says he has not unfrequently seen death rapidly follow such imprudent exertion. In this he is quite right; the lives of diabetics seem to hang by a thread, and any sudden change of diet or forced exercise, even though it be only a journey by rail, is fraught with danger, and must be cautiously carried out; sudden death from exhaustion, diarrhœa, or latent pneumonia being the not unfrequent result of such experiments.

We have read Dr Richardson's work with much interest. He is a painstaking and accurate observer, and we think that, with his limited opportunities, he would have done more service to medicine by an accurate record of his own experiences, than by attempting anything more ambitious. That was the gulf before him, which, filled up, might have given solid ground for the rest of us to travel on.

A Practical Treatise on the Medical and Surgical Uses of Electricity, including Localized and General Electrization. By E. M. BEARD, A.M., M.D.; and A. D. ROCKWELL, A.M., M.D. New York: Wood and Co.: 1871. 8vo, pp. 698.

Galvano-Therapeutics. By W. B. NEFTEL, M.D. New York: Appleton and Co.: 1871. 8vo, pp. 161.

DR NEFTEL'S little work is simply the precursor of a larger work on diseases of the nervous system, and on the relations of the galvanic current to physiology, medicine, and surgery. It is specially full of details in relation to electro-otiatrics, mainly based upon the researches of Brenner, and on the galvano-therapeutics of the sympathetic nerve, containing also many other interesting notices of the treatment of various other nervous diseases by galvanism or the direct current. It may be useful to those already acquainted with the subject, but it is far too curt to be of much value as a guide to those ignorant of the matter, while it is too one-sided to be accepted as a truthful statement of the proper place and position of galvano-therapeutics. With the professors of this art the motto of "Nothing like leather" seems never to be lost sight of, and there seems to be no disease which is not amenable to galvano-therapeutics. Yet if we endeavour to ascertain what is electricity, and how its action is variously modified by the various modes in which it is employed, we find the greatest difficulty in seeing our way to any grains of truth. At one time lauded as life itself, as the essence of nervous influence; at another it is depreciated as but the result of chemical action: now it is the constant current which is to work wonders, and the induced is reviled as of no value; while at another time and by another author the reverse is upheld. We suppose there can be no doubt but that electricity however produced is not only the result of chemical action, but also a powerful agent in producing chemical change, and therefore a most important agent in modifying the nutritive conditions of the living body; at the same time, we have as yet obtained no definite knowledge how we shall best employ this powerful modifying agent in medical diseases. A great deal of empirical knowledge of this kind is afloat, but as yet it is far too vague to be of much value. At present, stimulated mainly by the inquiries of Runak and Duchenne, electro-therapeutics is making a vigorous effort to assert its own peculiar value, which its professors are not prone to under-estimate. But if we take a wide survey of the field thus indicated, and examine the claims of the several modes of application of the electric fluid, there is so little unanimity in the statements of its advocates that we are fain to wait for more precise indications before we accept the therapeutics of electricity as anything more definite than a somewhat hopeful empiricism, to be resorted to when other means fail.

Drs Beard and Rockwell have sought to embody in their work all that is at present known of the application of electricity to the treatment and diagnosis of disease, both medical and surgical, and we commend it to those who are groping after truth in this direction, as a useful guide; at the same time, much that they have advanced as to what they have originated and described as a general electrization, requires to be otherwise confirmed before we can accept it as true. Nevertheless their work is thoroughly exhaustive and well up to the times; it is copiously illustrated, furnished with a good index and glossary of electro-therapeutic terms, and is calculated to afford much information to those who are feeling their way in this direction. The chapter on electro-surgery is especially instructive, and contains a good summary of all that has been done in this direction of late years.

Letter from C. MACNAMARA, Surgeon to the Chandney and Ophthalmic Hospitals, Calcutta, *to* J. SIMON, F.R.S., F.R.C.S., Medical Officer to the Privy Council.

Remarks on Mr Clark's Calcutta Drainage Scheme. By DAVID B. SMITH, M.D., Sanitary Commissioner for India. Calcutta, 1871.

MR MACNAMARA, in a letter to Mr Simon, the Medical Officer to the Privy Council, points out that it is desirable to obtain statistics of the diffusion of cholera in India, not only from the jail and army, but also from the civil population of the country, which he would "consider an honour to correlate and arrange." The Government of India have, however, not complied with this proposal of Mr Macnamara, who thus expresses his dissatisfaction :—" It is evidently useless for me, or any one holding the ideas I do regarding the propagation of cholera, to expect a hearing from those in authority in this country, and much less to be able, beneficially, to influence their actions ; at any rate, until such time as when, in the ordinary course of nature, the obstacle (*genus homo*) at present impeding correct views and salutary action in these matters is removed." It appears, however, that more than one person requires to be removed, by opportune death or invaliding, ere Mr Macnamara's theories are carried out by the Indian Government. " I can only speak," he goes on, " from personal experience, but my firm conviction is, that with the differences of opinion held by Mr Strachey, Sanitary and Medical Officers, on the subject of cholera, together with the want of forethought exercised by those whose duty it is to regulate these matters, that any number of vessels carrying either pilgrims, or other human freight, or merchandise, contaminated with cholera poison, might at any time proceed from this place, not only to Arabia, but directly to Europe. Attempts were made, as late as last year, to regulate the circumstances of pilgrims and emigrants leaving this port, but I fear it is difficult for men to legislate for the prevention of a disease like cholera when they have no definite conception of its nature."

Mr Macnamara then goes on to show that differences of opinion exist as to the means by which cholera spreads—a fact of which there can be no doubt, though one might think otherwise from the confident manner in which some medical men are at present lecturing the public on the subject. Mr Macnamara proves, by quotations, that Dr Cunningham, the Imperial Sanitary Commissioner of British India, and Dr Muir, the head of the Queen's Medical Service in India, regard the view that drinking water is the principal medium of spreading the disease as an unproved hypothesis, whilst Drs Buchanan and J. N. Radcliffe remark (1870)—" The propagation of certain epidemic diseases, especially cholera, intermittent fever, and diarrhœa, among communities, as the result of excremental pollution of air and water, is one of the best established facts of sanitary medicine. It is a fact which has been admitted for over a century."

Here we may warn young gentlemen beginning to study medical literature, that when they read that a point has been " incontestably proved," or is " now generally admitted," or " admitted for over a century," they ought to suspect the writer is trying to mislead them.

Mr Macnamara gives a number of very carefully collected details about the diffusion of cholera in Calcutta. He complains very justly of the large number of ponderous blue-books which for the last ten years or so have been printed by the Indian Government.

" The aggregate weight of these reports issued for the year 1868, by the newly-created Sanitary Department alone, in the Bengal Presidency, amounts to no less than 13 lbs., exclusive of jail reports, and those issued by the Indian Medical Department, Dispensaries, and so on; whereas the last Army Medical Department Report (British) weighs only 1¾ lbs.; this latter contains the Sanitary, Statistical, Medical—in fact, the entire Medical History of the British Army in India, and every other part of the world, for the year 1868."

His complaints to the sympathetic ear of Mr Simon leading to no practical result, Mr Macnamara deals with his adversaries in the pages of the *Indian Medical Gazette*, of which he is now the editor. For such a post he is very well fitted, though in our opinion his reputation is too much committed to a certain hypothesis about the diffusion of cholera to permit him to arrange statistics upon the subject in a calm and impartial manner. We do not know whether our readers will think he has strengthened his position by the following argument, which appeared in the number for 1st June 1871:—

> "A writer in the last number of the *Edinburgh Medical Journal* remarks: 'Mr Macnamara, in his book on cholera, predicted that the Suez Canal, by bringing ships from India more rapidly into European waters, would render Europe more liable to be visited by cholera. As yet his prophetic powers appear at fault.'
>
> "It may possibly be true that Europe runs no risk of an importation of cholera *viâ* the Suez Canal; nevertheless, I would point to the facts illustrated by the cholera diagram, to show how exceptionally low the death-rate from this disease has been among the *inhabitants of Calcutta* since the opening of the canal at the close of 1869: the same statement is applicable to Bombay; and beyond this, I would call particular attention to the circumstance that, on the 1st of January 1870, the Calcutta water-works were opened, and since then vessels leaving this port, in place of filling their tanks from the polluted Hooghly, have taken in water supplied from the admirable works above mentioned—water which, the Chemical Examiner to Government informs me, is as good as, if not superior to, any served from the finest works in England. Our emigrants leaving Calcutta for the West Indies or Mauritius are likewise provided with this excellent water, and the result seems already to have manifested itself in the lower rate of mortality from cholera among these people on the voyage to their new homes. It is, however, impossible for me to enter into details on a subject of this kind; I would only remark, that it has always appeared to me a weak point in Professor Pettenkofer's theory as to the origin of cholera, that the disease should at times break out among persons on board vessels after they had left port for some sixteen days, as in the case of the New York and Sewanton, or, as in the instance of the Gertrude, which had been at sea for twenty-four days before a case of cholera occurred on board. Evidently emanations from the soil could not affect persons in the middle of the ocean, and it is hardly possible the disease could have been contracted and remained dormant in the systems of these people for sixteen and twenty-four days, then bursting out among them without apparent rhyme or reason. But it may be argued, Do not the same objections apply to the watery theory of cholera? I think not, for the more carefully we study the matter the clearer it becomes that light and heat play a most important part in the oxidation of organic matter, either living or dead. If water containing organic matter were stowed away in iron tanks, it might remain in the dark cool hold of a ship for many days unaffected by the atmosphere; but bring this water upon deck for domestic purposes, and in a few hours the properties of the organic matter it contained may be

completely altered; and according to my experience, water polluted with cholera dejecta might, under these circumstances, become a cholera-giving fluid if swallowed in any considerable quantities without having been previously effectually filtered or boiled. I would here beg to remark in reference to these views, that it has been observed by several writers that the account I have given in my work on Cholera (page 196) is defective in that details are not produced of the precise circumstances of this remarkable case. On referring to the text I find it is evident that there is truth in these remarks, but I would now distinctly state that the case in question came directly under my own observation and that of a friend. Any further statement on this matter seems to me to be unnecessary; for with the detail I have published before them, those who still refuse to believe would not, I am convinced, be persuaded though one rose from the dead to assure them of the truth. I can only add, if any professional man requires further information on the subject, he may apply to me for particulars, and I will with pleasure supply the details he may require with regard to the particulars of this case; but in a scientific point of view it is fully discussed in my published work on the subject; nor will any amount of explanation I can give further elucidate the matter."

In a pamphlet of twenty-one pages, Dr David B. Smith advocates the dry-earth conservancy system, as being the best for Calcutta. He insists, in opposition to Mr Clark and others, that it is preferable to the removal of the solid sewage matter and water drainage, and that it would pay its own cost if the matter were used in manuring reclaimed land. Dr Smith handles the subject with his usual ability, and pushes his adversary hard.

The following quotation from Dr Cornish, Sanitary Commissioner of Madras, may be of general interest:—

"There is no doubt that the 'dry' system of conservancy is the best that could be devised for a country where the temperature of the air is always high.

"The evils of the sewage system in Europe are now gradually becoming apparent, and in another quarter of a century there is no question but that the nuisance will have become so serious as to lead to a thorough change of system. The rivers flowing through towns are in many instances already so polluted, that fish will not live in them; nor can the public drink of such water with impunity." Again, "the water-closets, house-drains, and sewers in European towns, it may be noticed, remain inoffensive during the months of spring and winter; but as the temperature of the air increases, so surely do the *cloacæ* begin to emit offensive effluvia, and the hotter the summer and autumn, the greater the nuisance from drains and running streams polluted by sewage. Whenever the temperature of water rises above 60° Fahr. it ceases to absorb gases well, and becomes therefore a bad vehicle for the removal of organic matter in a state of decomposition."

In our own country, we believe the dry-earth system to be very useful, especially for out-of-door closets. At Broadmoor Criminal Lunatic Asylum, which we recently visited, there was an in-door apparatus that worked well. No smell was perceptible.

Dry earth is, of course, not so easily got in our country as in India, hence arrangements should be made for storing it in summer.

INFORMATION REGARDING MEDICAL EDUCATION AND EXAMINATIONS.

THE following are the Regulations of the General Medical Council on the subject of Medical Education and Examinations:—

I.—PRELIMINARY EXAMINATIONS.

1. That Testimonials of Proficiency, granted by the National Educational Bodies according to the subjoined list, may be accepted, the Council reserving the right to add to, or take from, the list.

List of Examining Bodies whose Examinations fulfil the Conditions of the Medical Council, as regards Preliminary Education.

(1.) UNIVERSITIES OF THE UNITED KINGDOM.

Oxford.—Examination for a Degree of Arts. Responsions, Moderations, Local Examinations (Senior), Certificate to include Latin and Mathematics.

Cambridge.—Examination for a Degree in Arts. Previous Examination. Local Examinations (Senior), Certificate to include Latin and Mathematics.

Durham.—Examination for a Degree in Arts. Examination for Students in their second and first years. Registration Examination for Medical Students. Local Examinations (Senior), Certificate to include Latin and Mathematics.

London.—Examination for a Degree in Arts. Matriculation Examination.

Aberdeen, Edinburgh, Glasgow, and St Andrews.—Examination for a Degree in Arts. Preliminary Examination for Graduation in Medicine or Surgery. Examination of (Senior) Candidates for Honorary Certificates under the Local Examination of the University of Edinburgh.

Dublin.—Examination for a Degree in Arts. Entrance Examination.

Queen's University (Ireland).—Examination for a Degree in Arts. Entrance Examination. Examination for the Diploma of Licentiate in Arts. Previous Examination for B.A. Degree.

(2.) OTHER BODIES NAMED IN SCHEDULE (A) TO THE MEDICAL ACT.

Royal College of Surgeons of England.—Examination conducted under the Superintendence of the College of Surgeons, by the Board of Examiners of the Royal College of Preceptors.

The Society of Apothecaries of London.—Examination in Arts.

Royal Colleges of Physicians and Surgeons, Edinburgh.—Preliminary Examination in General Education, conducted by a Board appointed by these two Colleges combined.

Faculty of Physicians and Surgeons of Glasgow.—Preliminary Examination in General Literature.

Royal College of Surgeons in Ireland.—Preliminary Examination, Certificate to include Mathematics.

Apothecaries' Hall of Ireland.—Preliminary Examination in General Education.

(3.) EXAMINING BODIES, IN THE UNITED KINGDOM, NOT INCLUDED IN SCHEDULE (A) TO THE MEDICAL ACT.

Royal College of Preceptors.—Examination for a First Class Certificate.

(4.) COLONIAL AND FOREIGN UNIVERSITIES AND COLLEGES.

Universities of Calcutta, Madras, and Bombay.—Entrance Examination, Certificate to include Latin.

M'Gill College, Montreal.—Matriculation Examination.

University of Toronto, King's College, Toronto, Queen's College, Kingston, Victoria College, Upper Canada.—Matriculation Examination.

King's College, Nova Scotia.—Matriculation Examination. Responsions.

University of Fredericton, New Brunswick.—Matriculation Examination.

University of Melbourne.—Matriculation Examination, Certificate to include all the subjects required by the General Medical Council.

University of Sydney.—Matriculation Examination.

Codrington College, Barbadoes.—1. English Certificate for Students of two years' standing, specifying the subjects of Examination. 2. Latin Certificate, or "Testamur."

Tasmanian Council of Education.—Examination for the Degree of Associate of Arts, Certificate to include Latin and Mathematics.

Christ's College, Canterbury, New Zealand.—Voluntary Examination, Certificate to include all the subjects required by the General Medical Council.

The Examiners for Commissions in the Military and Naval Services of the United Kingdom.—Certificate to include all the subjects required by the General Medical Council.

Cape of Good Hope.—Third Class Certificate in Literature and Science granted by the Board of Public Examiners.

N.B.—A Degree in Arts of any University of the United Kingdom or of the Colonies, or of such other Universities as may be from time to time recognised by the General Medical Council, will be considered a sufficient testimonial of proficiency.

2. That it be recommended to the Licensing Boards not to accept the Certificate of Proficiency in General (preliminary) Education from any of the Bodies, the names of which are contained in the list annually circulated, unless such Certificate testify that the Student to whom it has been granted has been examined in:—1. English Language, including Grammar and Composition.[1] 2. Arithmetic, including Vulgar and Decimal Fractions. Algebra, including Simple Equations. 3. Geometry—First two books of Euclid. 4. Latin, including Translation and Grammar.

And in one of the following optional subjects:—Greek. French. German. Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.

3. That students who cannot produce any of the Testimonials referred to in the first Recommendation be required to pass an Examination in Arts, established by any of the Bodies named in Schedule (A) to the Medical Act, and approved by the General Medical Council.

II.—REGISTRATION OF MEDICAL STUDENTS.

1. Every Medical Student shall be registered in the manner prescribed by the General Medical Council.

2. No Medical Student shall be registered until he has passed a Preliminary Examination, as required by the General Medical Council.

3. The commencement of the course of Professional Study recognised by any of the Qualifying Bodies, shall not be reckoned as dating earlier than fifteen days before the date of Registration.

4. The Registration of Medical Students shall be placed under the charge of the Branch Registrars.

5. Each of the Branch Registrars shall keep a Register of Medical Students according to the subjoined Form:—

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[1] The General Medical Council will not consider any Examination in English sufficient that does not fully test the ability of the Candidate,—*1st*, To write a few sentences in correct English on a given theme, attention being paid to spelling and punctuation as well as to composition. *2d*, To write a portion of an English author to dictation. *3d*, To explain the grammatical construction of one or two sentences. *4th*, To point out the grammatical errors in a sentence ungrammatically composed, and to explain their nature. *5th*, To give the derivation and definition of a few English words in common use.

Form for the Registration of Medical Students.

Date of Registration.	NAME.	Preliminary Examination and Date.	Place of Medical Study.

6. Every person desirous of being registered as a Medical Student shall apply to the Branch Registrar of the division of the United Kingdom in which he is residing, according to the annexed Form, which may be had on application to the several Qualifying Bodies, Medical Schools, and Hospitals; and shall produce or forward to the Branch Registrar a Certificate of his having passed a Preliminary Examination, as required by the General Medical Council, and a statement of his place of Medical Study.

Form of Application for Registration as a Medical Student.

I hereby apply to be registered as a Student in Medicine, in conformity with the Regulations of the General Council of Medical Education and Registration of the United Kingdom, for which purpose I submit the following particulars:—

NAME OF APPLICANT. (To be written in words at length.)		Preliminary Examination.	Date of Preliminary Examination.	Place of Medical Study.
Surname.	Christian Name.			

Applicant's Signature ———.
Address ———————.
Date of Application ———.

To the Registrar of the Branch Council for ———.

N.B.—The above Form of Application, duly and legibly filled up, must be forwarded to the Registrar, post free, and be accompanied by a Certificate of the Applicant's having passed a Preliminary Examination, as required by the General Medical Council; and a statement of his place of Medical Study.

The Certificate of Examination must testify that the Student has been examined in,—1. English Language, including Grammar and Composition; 2. Arithmetic, including Vulgar and Decimal Fractions; Algebra, including Simple Equations; 3. Geometry—First two books of Euclid; 4. Latin, including Translation and Grammar. And in one of the following optional subjects:—Greek, French; German; Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.

7. The Branch Registrar shall enter the Applicant's name and other particulars in the Students' Register, and shall give him a Certificate of such Registration.

8. Each of the Branch Registrars shall supply to the several Qualifying Bodies, Medical Schools, and Hospitals, in that part of the United Kingdom

of which he is Registrar, a sufficient number of blank Forms of Application for the Registration of Medical Students.

9. The several Branch Councils shall have power to admit special exceptions to the foregoing regulations as to Registration, for reasons which shall appear to them satisfactory.

10. A copy of the Register of Medical Students, prepared by each of the Branch Registrars, shall be transmitted, on or before the 31st December in each year, to the Registrar of the General Council, who shall, as soon as possible thereafter, prepare and print, under the direction of the Executive Committee, an Alphabetical List of all Students registered in the preceding year, and supply copies of such authorized list to each of the Bodies enumerated in Schedule (A) to the Medical Acts, and through the Branch Registrars to the several Medical Schools and Hospitals.

11. The several Qualifying Bodies are recommended not to admit, after October 1870, to the final Examination for a Qualification under the Medical Acts, any Candidate (not exempted from Registration) whose name had not been entered in the Medical Students' Register at least four years previously.

In the case of Candidates from other than Schools of the United Kingdom, the Branch Councils shall have power to admit exceptions to this recommendation.

The Branch Councils are desired to take means to make these regulations known to the Medical Students at the various Medical Schools.

III.—AGE FOR LICENSE TO PRACTISE.

1. That the age of twenty-one be the earliest age at which a Candidate for any Professional License shall be admitted to his final Examination; that the age shall, in all instances, be duly certified; and that a Return of any exceptions to this recommendation allowed by the Licensing Bodies, together with the reasons for such exceptions, be transmitted to the Branch Council of that part of the United Kingdom in which they have been granted.

2. That no License be obtained at an earlier period than after the expiration of forty-eight months subsequent to the Registration of the Candidate as a Medical Student.

IV.—PROFESSIONAL EDUCATION.

1. That the course of Professional Study required for a License shall comprehend attendance during not less than four Winter Sessions, or three Winter and two Summer Sessions, at a School recognised by any of the Licensing Bodies mentioned in Schedule (A) to the Medical Act.

2. That the following are the subjects without a knowledge of which no Candidate should be allowed to obtain a qualification entitling him to be registered:—1. Anatomy. 2. General Anatomy. 3. Physiology. 4. Chemistry. 5. Materia Medica. 6. Practical Pharmacy. 7. Medicine. 8. Surgery. 9. Midwifery. 10. Forensic Medicine.

Chemistry should include a knowledge of the principles of Chemistry, and of those details of the science which bear on the study of Medicine.

Medicine and Surgery should include a knowledge of Systematic and Clinical Medicine and Surgery, and also of Morbid Anatomy.

3. That it be recommended to the several Licensing Bodies that the courses of instruction required by them be framed in such a manner as to secure a due share of attention, both to preparatory branches and to those more strictly connected with the Practice of Medicine and Surgery; and that it be suggested accordingly to these Bodies, that their regulations should be such as to prevent attendance upon Lectures from interfering with Hospital and Clinical Study.

4. That the Council will view with approbation any encouragement held out by the Licensing Bodies to Students to prosecute the study of the Natural Sciences before they engage in studies of a strictly professional character.

V.—PROFESSIONAL EXAMINATION.

1. That it is desirable that the different Licensing Bodies should combine their Examinations, when this is practicable, so as to secure that the knowledge of every Practitioner whose name appears on the Register shall have been tested in all the subjects of Professional Education which the Council has determined to be essential, viz.:—1. Anatomy. 2. General Anatomy. 3. Physiology. 4. Chemistry. 5. Materia Medica. 6. Practical Pharmacy. 7. Medicine. 8. Surgery. 9. Midwifery. 10. Forensic Medicine.

2. That those Licensing Bodies which have not already done so, be requested to furnish a statement of the dates of their Examinations and of the modes in which such Examinations are conducted, whether by written, oral, or practical Examination, and of the length of time a Candidate is under Examination in each or all of these ways; and that the Registrar transmit these Reports to the Members of the Council, in order that they may be taken into consideration at the next meeting of the several Branch Councils.

3. That the Professional Examination for any License be divided into two parts; the first embracing the primary or fundamental branches directly connected with the practice of Medicine and Surgery; that the former be not undergone till after the close of the Winter Session of the second year of professional study; and the latter, or final Examination, not till after the close of the prescribed period of professional study.

4. That the Examination in Physics, Botany, and Natural History may be undergone at an earlier period than the first Professional Examination.

5. That the Professional Examinations be conducted both in writing and orally; and that they be practical in all branches in which they admit of being so.

6. That not less than two Examiners, or one Examiner with an Assessor, should be present at every Oral Examination.

7. That the Oral Examinations should be so far public as to be open at least to the Medical and Surgical Graduates, or members of the Examining Body.

8. That the questions to be answered in writing should be so numerous, and embrace such a variety of the details of each subject, as may adequately test the proficiency of the Candidate; and that they should be submitted to the whole body of Examiners for consideration and revision, if desirable, before being proposed to the Candidates.

9. That the written answers should be submitted to more than one of the Examiners.

10. That excellence in one or more subjects should not be allowed to compensate for failure in others.

11. That if a Candidate be rejected for failure in any one subject, he should be re-examined in all.

12. That Examiners should only be elected for definite periods, with power of re-appointment.

13. That the Professional Examinations be held by the several Licensing Bodies, except in special cases, at stated periods, to be publicly notified.

14. That returns from the Licensing Bodies in Schedule (A) be made annually, on the 1st of January, and in the subjoined form, to the General Medical Council, stating the number and names of the Candidates who have passed their first as well as their second and third Examinations, and the number of those who have been rejected at the first and second and third Examinations respectively; and that the Registrar forward a sufficient number of forms, with a notice for their being returned in due time.

Table of Return of Professional Examinations, and their Results.

Licensing Bodies.	Qualifications.	No. Passed.			No. Rejected.		
		1st Exam.	2d Exam.	3d Exam.	1st Exam.	2d Exam.	3d Exam.

15. That for the future the Licensing Bodies, which do not already do so, distinguish separately in their Returns the names and numbers of Candidates examined, and the numbers of those passed and rejected at the examinations for each of the qualifications conferred.

16. That it is not desirable that any University of the United Kingdom should confer any degree in Medicine or Surgery, whether that of Bachelor, Doctor, or Master, upon Candidates who have not graduated in Arts, or passed all the Examinations required for the Bachelorship in Arts, or the Examinations equivalent to those required for a degree in Arts.

REMARKS ON MEDICAL STUDY.

No one is a Medical Student in the eye of the law until he has been registered as such, and a necessary precursor to registration is the passing a Preliminary Examination. This Preliminary Examination has already been the means of elevating the standard, and giving medical teachers a better class of embryo from which to develop the full-fledged medical man. That it has not done more in this direction is due partly to the negligence of the examiners engaged in the work, and partly to defects in the curriculum imposed. Only those who have to wade through masses of examination papers are aware of the amount of bad spelling and bad grammar which strives to pass current as good English in those ofttimes wonderful productions; while when deficiency in English is so common, we need not wonder at the Latin being still more preposterous. From a pretty large experience of medical teaching and examining, we have no hesitation in saying that it is the exception and not the rule for a medical student of the present day to be able to write a prescription in full in correct Latin; indeed, when recently remonstrating with a student in regard to this, we were told that the examiners of a university, wont to be in the van, had ceased to require a Latin prescription to be written in full, because of the impossibility of getting it correctly done. Yet, not many years ago, the whole of the Examination at this University was conducted in Latin, and the race has not degenerated either in mind or body. The moral is obvious: it is useless to recommend; we must require, we must not appeal to embryo students from love of their chosen profession to prepare themselves more fully and more accurately for entering successfully upon its study. With all but the few who do not require it, such an appeal would be simply quixotic; but we may with more hope of success appeal to the Examiners to see that the requirements of the Medical Council are strictly fulfilled; and when this has been attained, we may then appeal to the Council itself to extend its Preliminary Examination, so as to make it embrace more fully all those subjects necessary to constitute it an adequate preliminary to the more strictly professional subjects of study. It is too much to expect the ingenuous youth of Britain to devote their energies to preparatory studies the influence of which upon their future professional acquirements they can neither perceive nor understand; it is also too much to expect paterfamilias, harassed by his own troubles and ignorant of those which await his son in a profession which he probably knows only in its least important—its mercantile—phase, wisely to direct those early studies which have for their objects the more ready acquirement of professional knowledge, and the ultimate advancement of medical science; and our primary and secondary schools are almost totally deficient in that careful and exact elementary training in the methods of science which forms a necessary preparation for the wise conduct of scientific observation, for entirely a similar reason, viz., the ignorance of the teachers as to the requisite constituents of a true scientific training. Already, however, some of our best schools are widening their basis, and, without diminishing their attention to either ancient or modern languages, are bestowing some upon those branches of study, as botany, zoology, chemistry, etc., which serve to develop the mind more equally and to correct the lopsided tendency produced by too strict an adherence to simply linguistic acquirements. It is to the gradual increase of similar endeavours to train the mind in accurate observation and careful reasoning, both of which may and ought to be taught from earliest youth, that we shall ultimately have a race to whom "The Battle of Dorking" shall be a simple impossibility. For, as Professor Gairdner has said in his recent Lectures on Medical Education, that battle is even now being fought in our workshops, our factories, and our medical schools, and want of scientific training has placed us on the losing side. So far as the medical profession is concerned, much may be done by strictness on the part of the Preliminary Examiners and by an ultimate extension of the subjects of Preliminary Examination, and we may be certain that both students and teachers will rise to the occasion, and neither will be found deficient in the necessary acquirements when these are accurately known and rigidly required. But though this may ensure us a race of students capable of being educated into something more than mere average practitioners, it will not nowadays suffice to place us in the van of medical science. We may become, as we have always in a measure been, first-rate Medical Practititioners—we may make a rational and useful employment of scientific knowledge obtained elsewhere; but we can never originate that knowledge, never become Medical philosophers. Is that a position worthy of the compatriots of Sydenham, Hunter, Whytt, Cullen, and Monro? Certainly not; and yet how can it be otherwise? Our Universities and Infirmaries have neither Pathological, Physiological, nor Chemical laboratories in which to carry on those laborious investigations which, carried on elsewhere and in recent times, have done much to rescue Medicine from that tangled maze of hopeless empiricism in which it seemed destined ever to wander. It is only by careful systematic research in physics and chemistry that any advance in Medical Science can now be made; and only those who, having charge of infirmary wards, have sadly seen opportunities for making important advances slip past them for want of the means of getting such systematic researches made, can fully realize the loss to mankind from our supineness in these matters. Edinburgh has now before it a noble opportunity of redeeming its pristine fame, and, amid all the competition going on around, of once more placing itself in the van of Medical Science, in these islands at least. A new Infirmary is about to be erected, on perhaps the noblest site in Europe, and we trust that its promoters will not forget that though the mere care of the sick may be adequately enough provided for by airy wards and careful nursing, their cure is only to be attained by providing efficient means of systematically investigating disease by all the physical and chemical means which modern science has so richly placed at our disposal. It is impossible to over-estimate the importance of such a procedure in a philanthropic point of view; it is equally impossible to foresee the great advances in Medical Science which would thus be rendered possible, or the height of fame to which our Edinburgh Medical School might be carried. We have no want of material, we only want opportunity; and those only who are conversant with the progress made during the last ten years in Continental schools can realize how great that want is, how sadly we have lagged behind in all that is worth striving for, or how earnestly we hope that now, when the opportunity offers, our wishes may be crowned with success, and free scope once more given to our *perfervidus genius.* Failing this, there is no resource but to write over the portico of our world-renowned University the mournful expression of national failure—Ichabod.

In all this it may be said we have forgotten our friends who are about to commence their studies, and the few words of advice it is customary to give them at this time. It is not so. But once a year have we any opportunity of giving vent to our thoughts, and we feel so strongly that, badly put and imperfectly expressed as they may be, if no attention be paid to them, we shall in the future have no students to address, or who will be worth addressing, that it is no wonder if for the moment we have

> "Lost the whole of sense and being
> In the fulness of our love"

for our profession and our noble Medical School. To return to our muttons, however, we may say that the foregoing Regulations of the General Medical Council are so full and explicit that the Medical Student can be at no loss as to what is required of him. It is necessary for him, however, also carefully to study the Regulations of the particular Boards before which he intends to present himself, as, though uniformity of education has of late years made great advances, it is not yet obligatory, and trifling variations unattended to in time, may produce serious consequences at an after period of his career.

On the best method of pursuing Medical Studies, our counsel may be condensed in a few words. Four years are short enough for acquiring the extended information at present required by the Licensing Boards, even as a *minimum.* The Student therefore cannot too soon begin in earnest. During the session, he should lay out a plan of his hours of lectures, practical work, and private study, with sufficient intervals of healthful recreation; and should carry out this plan with unswerving steadiness, ever remembering that steady work, and a habit of looking at all sides of a question or fact, is worth any amount of so-called talent and desultory exertion. During vacation, time may be properly spent in practical work, as assistant to a medical practitioner, or in reading, either to complete past work or in anticipation of the subjects of study for next session. To Students who wish to attain to high honours or position in the profession, we should recommend five years, instead of four, for professional study; or, at all events, they would find great advantage from an acquaintance with Natural History, Natural Philosophy, Chemistry, and Botany, before commencing their strictly Medical studies. This object might be attained by attending classes on these subjects during the summer, previous to the winter session which begins their Medical curriculum.

To all Students we should strongly recommend to join, after their first year, some of the debating societies which are now found in connexion with most medical schools, and of which the Royal Medical Society of Edinburgh, with its spacious rooms and large library, is an excellent example. The mental vigour derived from independent thought and free discussion, and the genial influences of friendship for which these societies afford opportunity, are of great value in the education of the Medical Student, and contribute, in no small degree, to a successful career in after life.

And we would also recommend all, after passing, to obtain an hospital appointment, or at least an assistantship in private practice, so that they may acquire the necessary confidence in themselves, and experience in the ways of the world necessary to ensure success before they are thrown on their own resources.

The following pages contain a tabular abstract of the regulations of the various Licensing Boards, as well as a list of the Hospitals, Dispensaries, etc., attached to our Scotch Medical Schools; also the regulations for the Army, Indian, and Navy Medical Services. The space at our disposal does not allow of more detailed information. But, in point of fact, the regulations of all Licensing Boards now correspond much more closely than they used to do, and the regulations of the General Medical Council afford a key to the general requirements of all of them. For special information, application should always be made to the Secretaries of the Licensing Boards; or, in the case of the Universities, recourse may be had to the published Calendars.

The *Preliminary Examinations* are usually held before the commencement, and at the end, of the Winter Session,—viz., in October, March, or April—sometimes also at the end of the Summer Session. The Professional Examinations in Universities are usually after the Winter and during the Summer Sessions; in Edinburgh, however, the first professional is held in October as well as April. The other Licensing Boards' examinations are held at various periods throughout the year. Special examinations, under circumstances of urgency, can be held at almost any time; but they, of course, entail considerable addition to the expense.

COURSE OF STUDY REQUIRED BY THE VARIOUS BOARDS OF THE UNITED KINGDOM.

	Age.	Anatomy.	Dissections.	Chemistry.	Practical Chemistry.	Materia Medica.	Physiology or Institutes of Medicine.	Surgery.	Practice of Medicine.	Midwifery.	Medical Jurisprudence.	Pathology or Morbid Anatomy.	Botany.	Natural History.	Practical Pharmacy.	Clinical Surgery.	Clinical Medicine.	Hospital Attendance.	Practical Midwifery.	Dispensary or Out-door Practice.	Vaccination.
	Years.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	Mons.	
Edinburgh University, M.B. & C.M.,	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	3 mo., or 6 cas.	6	
University of Glasgow, M.B. & C.M.,	21	6	6	6	3	6	6	6	6	6	3	6	3	3	3	6	6	24	do.	6	
University of Aberdeen, M.B. & C.M.,	21	12	6	6	3	6	6	6	6	6	3		3		3	6	6	24	do.	6	
University of St Andrews, M.D.,	22	12	12	6	3	3	6	6	6	3	3		3	3		6	6	24			
London University, M.B.,	21	6	12	6	1 crs	1 crs	6	6	6	1 crs	1 crs				1 crs	2 yrs.	2 yrs.	4 yrs.	20 cas.	6	
University of Durham, M.B. & M.D.																					
Dublin University, M.B.,		6		6	3 ms	6	6	6	6	6	3		3			9	9	18			
" " Surgical Diploma,		18	18	6	3	6	18	18	6	6	3		3			27	27	27			
The Queen's University of Ireland, M.D.,		12	12	6	3	6	12	6	6	6	3		3	3	3 mos.	12	12	24	3 mo.		
Royal College of Physicians, London,	21	12	12	6	3	3	12	6	12	3	3	6	3		3		9	24	20 cas.		
Royal College of Physicians, Edinburgh,	21	6	6	6	3	3	6	6	6	3	3	3	3		3	3	6	24	6 cases		
King and Queen's Col. of Phys. Ireland,	21	6	12	6	6	6	6	6	6	6	6		6			6	21	27	6 mo.		
Royal College of Surgeons, London,*	21	12	12	6		3	12*	12	6	3					3	27*	9*	33			Cert.
Royal College of Surgeons, Dublin,	21	18	18	6	6	3	18	18	6	3	3					18	9	27			
Royal College of Surgeons, Edinburgh,	21	12	12	6	3	3	3	6 or 12	6	3	3	3			3	6 or 12	6	24	6 cas.	6	Cert.
Faculty of Phys. and Surgeons, Glasgow,	21	12	12	6	3	3	3	6 or 12	6	3	3				3	6 or 12	6	24	6 cas.		
For Double Qualification by Royal College of Phys. and Surg. of Edinburgh,	21	12	12	6	3	3	3	6 or 12	6 or 12	3	3	3	3		3	6 or 12	6 or 12	24	6 cas.	6	Cert.
For Double Qualification by Royal College Phys. Edinburgh, and Faculty of Physicians and Surgeons of Glasgow,	21	12	12	6	3	3	6	6 or 12	6	3	3	3			3	6 or 12	12	24	6 cas.		
Apothecaries' Hall, England,	21	12	6	6	3	3	6		12	3	3	6	3		Appr.		27	27	20 cas.		9 mo.
" Ireland,	21	6	12	6	3	3	6	6	6	6	3		3		Appr.	9	18	27	20 cas.		

English Poor-Law Board.—Candidates for the appointment of Medical Officer are required to be registered under the Medical Act, and must be legally qualified to practise both Medicine and Surgery, in virtue of Diplomas or Licenses granted by competent legal authority in England, Scotland, or Ireland.

Information respecting exceptions to these regulations under various circumstances, and other details as to the order in which, according to some Licensing Bodies, the courses should be taken out, etc., must be obtained by consulting the published Charts of the Colleges, etc. Students should apply to the Secretary to each Board which they intend to pass for a detailed copy of its Regulations.

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* Students from the Schools of Scotland are admitted to examination at the Royal College of Surgeons of England, if they have followed the course of study required by the regulations of the Royal College of Surgeons of Edinburgh. Students in Scotland, therefore, are not required to attend more than one course of Physiology, six months Clinical Surgery, six months Clinical Medicine, and twenty-four months Hospital.

MEDICAL SCHOOLS OF SCOTLAND, 1871–72.

WINTER SESSION.

SUBJECTS.	UNIVERSITY OF EDINBURGH.	SCHOOL OF MEDICINE, EDINBURGH.	UNIVERSITY OF GLASGOW.	ANDERSON'S UNIVERSITY, GLASGOW.	UNIVERSITY OF ABERDEEN.	UNIVERSITY OF ST ANDREWS.
Anatomy, Systematic and Practical, with Demonstrations.	Professor Turner.	Dr Handyside.	Professor A. Thomson.	Dr George Buchanan.	Professor Struthers.	...
Physiology, or Institutes of Medicine.[*]	Professor Bennett.	Dr Gamgee.	Professor A. Buchanan.	Dr E. Watson.	Professor Ogilvie.	Professor Oswald Bell.
Chemistry, and Practical Chemistry.	Professor C. Brown.	Dr Macadam.	Professor T. Anderson.	Dr Thorpe.	Professor Brazier.	Professor Heddle.
Materia Medica and Therapeutics.	Professor Christison.	In Summer.	Professor Cowan.	Dr Morton.	In Summer.	...
Practice of Medicine.	Professor Laycock.	Dr Haldane.	Professor Gairdner.	Dr M'Call Anderson.	Professor Macrobin.	...
Surgery.	Professor Spence.	Dr Watson.[†] Dr Jos. Bell. Mr Annandale.	Professor Macleod.	Dr Dunlop.	Professor Pirrie.	...
Midwifery.	Professor Simpson.	Dr J.M.Duncan.	Professor Leishman.	In Summer.	Professor Inglis.	...
Natural Philosophy.	Professor Tait.	Mr Lees.	Professor Sir Wm. Thomson.	Mr Herschel.	Professor Thomson.	Professor Swan.
Natural History.	Professor Allman.	...	Professor Young.	...	Professor Nicol.	Professor Macdonald.
General Pathology.	Professor Sanders.	Dr Wyllie.	...	...	...	...
Clinical Medicine.	Professors Bennett, Laycock, Maclagan, and Sanders.	Drs Haldane,[‡] Balfour, G. Stewart, and J.M.Duncan.	The Physicians of the Royal Infirmary.		Drs Harvey, Smith, and Beveridge.	...
Clinical Surgery.	Professor Lister.	Mr Annandale.	The Surgeons of the Royal Infirmary.		Drs Pirrie, Kerr, and Fiddes.	...

[*] This course is equivalent to that given under the name of General Anatomy and Physiology in the English Schools. Special schedules are issued by the London Boards for their Scotch students, which should always be inquired for.

[†] These are not conjoint courses, but separate ones by the gentlemen named.

[‡] This is a joint course.

MEDICAL SCHOOLS OF SCOTLAND, 1872.

SUMMER SESSION.

SUBJECTS.	UNIVERSITY OF EDINBURGH.	SCHOOL OF MEDICINE, EDINBURGH.	UNIVERSITY OF GLASGOW.	ANDERSON'S UNIVERSITY, GLASGOW.	UNIVERSITY OF ABERDEEN.
Practical Anatomy and Demonstrations.	Professor Turner.	Dr Handyside.	Professor A. Thomson.	Dr George Buchanan.	Professor Struthers.
Botany.	Professor Balfour.	...	Professor A. Dickson.	Mr Hennedy.	Professor Dickie.
Materia Medica.	...	Dr Fraser.	...	...	Professor Harvey and Dr Davidson.
Midwifery.	...	Drs Keiller * and Macdonald.	...	Dr Wilson.	...
Medical Jurisprudence.	Professor Maclagan.†	Dr Littlejohn.†	Professor Rainy.†	Dr P. A. Simpson.	Professor Ogston.†
Comparative Anatomy.	Professor Turner.	Dr Handyside.	...	...	Prof. Nicol.
Histology.	Professors Bennett * and Sanders.	Drs Wyllie and Gamgee.	...	...	Professor Struthers.
Practical Chemistry.	Professor Crum Brown.	Dr Macadam.	Professor T. Anderson.	Dr Thorpe.	Prof. Brazier.
Natural Philosophy.	...	Mr Lees.	...	...	...
Natural History.	...	...	Professor Young.	...	Prof. Nicol.
Clinical Medicine.	Professors Bennett, Laycock, Maclagan, and Sanders.	Drs Haldane,‡ Balfour, G. Stewart, and J. M. Duncan.	The Physicians of the Royal Infirmary.		Drs Harvey, Smith, and Beveridge.
Clinical Surgery.	Prof. Lister.	Mr Annandale.	The Surgeons of the Royal Infirmary.		Drs Pirrie, Kerr, and Fiddes.

Operative Surgery is taught during the Summer by Drs Watson, Miller, Chiene, and Mr Annandale. Instruction in Vaccination is also given at the Royal Public Dispensary, Edinburgh, on Wednesdays and Saturdays at 12, by Dr Husband; at the Faculty Hall, Glasgow, on Mondays at 12, by Dr Dunlop; and at the Royal Infirmary, Glasgow, on Mondays and Thursdays at 12 o'clock, by Dr Tannahill.

* These are not conjoint courses, but separate ones by the gentlemen named.

† Drs Rainy and Ogston deliver their courses only in Winter. Dr Littlejohn gives courses during both the Winter and Summer Sessions. Dr Maclagan also lectures during both Summer and Winter. The Winter Course is chiefly intended for law students, but is open to medical students also.

‡ This is a joint course.

*** For additional Summer Courses on special subjects, see the Prospectus of each School.

LIST OF HOSPITALS, DISPENSARIES, ETC., IN CONNEXION WITH THE MEDICAL SCHOOLS OF SCOTLAND.

EDINBURGH.

ROYAL INFIRMARY, including LOCK HOSPITAL. Upwards of 560 Beds. Visits daily from 12 till 2 P.M. Physicians—Drs Bennett, Laycock, Maclagan, and Sanders, Professors of Clinical Medicine; Drs D. R. Haldane, G. W. Balfour, and Grainger Stewart, Clinical Lecturers; Dr J. Matthews Duncan (on Diseases of Women). Assistant Physicians—Drs Claud Muirhead and T. R. Fraser. Pathologist, Dr Pettigrew.

Surgeons—Mr Lister, Professor of Clinical Surgery; Professor Spence; Dr Gillespie; Dr P. H. Watson; and Mr Annandale, Clinical Lecturer. Assistant Surgeons, Drs J. Bell and J. Duncan. Consulting Surgeon, Dr Dunsmure. Ophthalmic Surgeons, Mr Walker and Dr Argyll Robertson. Dental Surgeon, Dr John Smith.

CONVALESCENT HOUSE, Corstorphine. Visiting Medical Officer, Dr Bell.

CHALMERS HOSPITAL FOR THE SICK AND HURT. 24 Beds for medical and surgical patients. Physician, Dr Halliday Douglas; Surgeon, Dr P. H. Watson.

ROYAL MATERNITY HOSPITAL. 36 Beds; 245 in-patients and 336 out-patients annually. Consulting Physician, Dr Moir. Physicians, Drs Keiller, C. Bell, Ziegler, Matthews Duncan, and Professor Simpson. Consulting Surgeon, Dr Dunsmure.

ROYAL HOSPITAL FOR SICK CHILDREN. 60 Beds; average number of out-patients, about 5600. Consulting Physicians, Professor Christison, Dr C. Wilson, and Dr Graham Weir. Consulting Surgeon, Professor Spence. Physicians, Drs Stephenson, R. Peel Ritchie, J. Linton, and A. Gamgee. Extra Physicians, Drs Millar and Brakenridge. Surgeon-Dentist, Dr Smith.

ROYAL PUBLIC DISPENSARY AND VACCINE INSTITUTION. About 12,700 patients annually. Medical Officers, Drs Ritchie, Stephenson, Cairns, Spence, Linton, G. W. Balfour, Sanders, Husband, D. Wilson, Millar, Smart, and Andrew. Physicians-Accoucheurs—Drs Keiller, Matthews Duncan, Stephenson, and Cairns. Superintendent of Vaccination, Dr Husband. Medical Secretary, Dr Millar. Clinique daily at 2 P.M. Vaccination on Wednesdays and Saturdays at 12 noon. Apothecary, Mr R. Urquhart.

NEW TOWN DISPENSARY. About 9000 patients annually. Medical Officers, —Drs Dycer, Joseph Bell, A. Dickson, Chiene, Cunynghame, Brakenridge, Affleck, and Cadell. Physicians-Accoucheurs, Drs Dumbreck, Weir, and Angus Macdonald. Superintendent of Vaccination, Dr Affleck. Medical Secretary, Dr Joseph Bell. Clinique daily at 2 P.M. Vaccination on Tuesdays and Fridays from 12 to 1.

DISPENSARY FOR SKIN DISEASES, 4 Melbourne Place (George IV. Bridge). Open on Mondays and Thursdays from 2 till 3 o'clock. Surgeon, Mr G. Stevenson Smith.

ROYAL ASYLUM FOR THE INSANE. About 660 patients. Physician, Dr Skae. Lectures and Clinical Visits in summer.

EYE INFIRMARY, 6 Cambridge Street, Lothian Road. Surgeons, Benjamin Bell, Esq., F.R.C.S., and Dr Joseph Bell, F.R.C.S. Open daily at 1 P.M. Average number of patients annually, 900.

EYE DISPENSARY, Cockburn Street. About 2000 patients annually. Surgeons, Mr Walker, Dr Wilson, and Dr Argyll Robertson. Open Mondays, Wednesdays, and Fridays, at 1 P.M. Clinical instruction during the summer session.

EAR DISPENSARY, 54 Cockburn Street. Drs T. Keith and Jackson. Tuesdays at 12. Average, about 20 cases daily.

DENTAL DISPENSARY, Cockburn Street. Consulting Surgeon, Professor Spence. Consulting Physician, Dr Sanders. Dental Surgeons, Dr Orphoot, Mr Hutchins, Dr Roberts, Dr Hogue, Mr Knox Chisholm, Mr Swanson. Assistant Dental Surgeon, Mr Chisholm, jun. Daily, 9 to 10 A.M. Average number of patients, 4000 per annum.

GLASGOW.

ROYAL INFIRMARY. 550 Beds. Visits daily at 9 A.M. Physicians, Drs W. T. Gairdner, Steven, Perry, M'Laren, M'Call Anderson, and Scott Orr. Physicians to out-patients, Drs P. A. Simpson, Lindsay, Charteris, and Wood Smith.

Surgeons, Drs E. Watson, Dewar, G. H. B. Macleod, George Buchanan, and Morton. To out-patients, Drs Dunlop, Patterson, R. Watson, Smart, and Cameron. Pathologist, Dr Joseph Coats. Superintendent, Dr M. Thomas.

LOCK HOSPITAL. 81 Beds. Medical Officers, Drs G. H. B. Macleod and James Dunlop. In-patients, 520.

LYING-IN HOSPITAL AND DISPENSARY. 24 Beds; in-patients, 360; out-patients, 400. Physicians-Accoucheurs, Drs J. G. Wilson and R. D. Tannahill. Consulting Physician (vacant). Consulting Surgeon, Dr George Buchanan. Dispensary Physicians, Drs John Burns, R. T. Paton, G. Miller, and H. Millar.

UNIVERSITY LYING-IN HOSPITAL AND DISPENSARY. In-patients, about 750; out-patients, about 4000. Physicians, Drs Leishman and John Wilson.

ROYAL ASYLUM FOR THE INSANE. About 680 patients. Physician-Superintendent, Dr A. Macintosh.

EYE INFIRMARY. 24 Beds; 132 in-patients; 3139 out-patients annually. Physician, Harry Rainy, M.D. Surgeons, William Brown, M.D., Thomas Reid, M.D. Assistant-Surgeons, Matthew Charteris, M.D., R. Watson, M.D. House Surgeon, Archibald Neilson, L.F.P.S.G. and R.C.P.E.

EAR DISPENSARY. About 400 patients annually. Surgeon, Dr Dewar. Open on Tuesdays, Thursdays, and Saturdays, at 3 P.M.

DISPENSARY FOR SKIN DISEASES. About 1400 patients. Physician, Dr M'Call Anderson. Practical Courses in Diseases of the Skin and Ear, during May, June, and July. The Dispensary is open on Mondays and Wednesdays at 4 P.M., and on Tuesdays for Diseases of the Ear at the same hour.

OPHTHALMIC INSTITUTION. Consulting Physician, Dr Charles Ritchie. Surgeon, Professor Macleod. Physician, Dr J. Adams. Acting Surgeon, Dr J. N. Wolfe. Open daily from 1 to 3 P.M. A Course of Lectures and Clinical Instruction during the winter and summer months.

ABERDEEN.

ROYAL INFIRMARY. Upwards of 300 Beds. Visits daily at 12 o'clock. Physicians, Drs Harvey, Smith, and Beveridge.

Surgeons, Drs Kerr, Pirrie, Fiddes, and A. Ogston. Ophthalmic Surgeon, Dr Davidson. Pathologist, Dr Rodger. Dental Surgeon, Mr Williamson.

GENERAL DISPENSARY, LYING-IN AND VACCINE INSTITUTION. 7000 patients annually. Medical Officers, Drs Angus Fraser, Duncan, and Brown; Messrs Smith, Paterson, and Fraser. Physician-Accoucheur, Dr Inglis. Dental Surgeon, Mr De Lessert. Visits daily at 9.30 A.M. Vaccination every Wednesday at 3 P.M.

LUNATIC ASYLUM. Above 300 patients. Consulting Physician, Dr Macrobin. Resident Physician, Dr Robert Jamieson.

EYE INSTITUTION, General Dispensary Buildings, Guestrow. Surgeon, Dr Davidson. Open daily, except Sunday, at 2.30 P.M. Clinical Instruction on Diseases of the Eye, and the use of the Ophthalmoscope. Average, 600 patients annually.

ARMY MEDICAL DEPARTMENT.

6 WHITEHALL YARD, S.W.

QUALIFICATIONS AND EXAMINATION OF CANDIDATES FOR COMMISSIONS IN THE ARMY MEDICAL SERVICE.

1. Every candidate desirous of presenting himself for admission to the Army Medical Service must be unmarried, and not under 21 nor over 28 years of age. He must produce a Certificate from the District Registrar, in which the date of birth is stated; or, if this cannot be obtained, an affidavit from one of the parents or other near relative, who can attest the date of birth, will be accepted. He must also produce certificates of moral character, one of them from the parochial minister, if possible.

2. The candidate must make a declaration that he labours under no mental or constitutional disease, nor any imperfection or disability that can interfere with the most efficient discharge of the duties of a medical officer in any climate.[1] He must also attest his readiness to engage for general service, and to proceed on foreign service when required to do so.

3. The candidate must be registered under the Medical Act of 1858 as licensed to practise Medicine and Surgery in Great Britain or Ireland.

4. Certificates of registration, character, and age must be lodged at the Army Medical Department at least one week before the candidate appears for examination.

5. Candidates will be examined by the Examining Board in the following subjects:—Anatomy and Physiology; Surgery; Medicine, including Therapeutics, the Diseases of Women and Children, Chemistry and Pharmacy, and a practical knowledge of drugs. (The examination in Medicine and Surgery will be in part practical, and will include operations on the dead body, the application of surgical apparatus, and the examination of Medical and Surgical patients at the bedside.) The eligibility of each candidate for the Army Medical Service will be determined by the result of the examinations in these subjects only. Candidates who desire it will be examined in Comparative Anatomy, Zoology, Natural Philosophy, Physical Geography, and Botany, with special reference to Materia Medica, and the number of marks gained in these subjects will be added to the total number of marks obtained in the obligatory part of the Examination by candidates who shall have been found qualified for admission, and whose position on the list of successful competitors will thus be improved in proportion to their knowledge of these branches of science.

6. After passing this examination, every candidate will be required to attend one entire course of practical instruction at the Army Medical School on—(1) Hygiene; (2) Clinical and Military Medicine; (3) Clinical and Military Surgery; (4) Pathology of Diseases and Injuries incident to Military Service.

7. At its conclusion, the candidate will be required to pass an examination on the subjects taught in the School. If he give satisfactory evidence of being qualified for the practical duties of an Army Medical Officer, he will be eligible for a commission as assistant-surgeon.

8. During the period of his residence at the Army Medical School each candidate will receive an allowance of 5s. per diem with quarters, or 7s. per diem without quarters, to cover all costs of maintenance; and he will be required to provide himself with uniform (viz., the regulation undress uniform of an assistant-surgeon, but without the sword).

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[1] His physical fitness will be determined by a Board of Medical Officers, who are required to certify that the candidate's vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses. A moderate degree of myopia would not be considered a disqualification, provided it did not necessitate the use of glasses during the performance of operations, and that no organic disease of the eyes existed. Every candidate must also be free from organic disease of other organs, and from constitutional weakness or other disability likely to unfit him for military service in any climate.

9. All candidates will be required to conform to such rules of discipline as the Senate may from time to time enact.

The examinations for admission to the service are held at the London University, Burlington Gardens, on the second Monday in February and August respectively, and on the following days.

EXTRACTS FROM THE ROYAL WARRANT (APRIL 1, 1867) FOR THE PAY AND NON-EFFECTIVE PAY OF MEDICAL OFFICERS.

The daily rates of pay of the officers of the Medical branch of the Hospital Department of our Army shall be as follows:—

Medical Staff.—Daily pay: director-general, special; inspector-general £2, after twenty-five years' service £2, 5s., after thirty years' service £2, 7s., after thirty-five years' service £2, 10s.; deputy inspector-general £1, 10s., after twenty-five years' service £1, 12s., after thirty years' service £1, 15s., after thirty-five years' service £1, 17s.; surgeon-major £1, 4s., after twenty-five years' service £1, 7s.; surgeon 17s. 7d., after fifteen years' service 20s.; assistant-surgeon, on appointment 10s., after five years' service 12s. 6d., after ten years' service 15s., after fifteen years' service 17s. 6d. Charge pay: the officer in medical charge of an army in the field, of 10,000 men and upwards, £1 daily; of 5000 men and upwards, 15s. daily; of less than 5000, 10s. daily. Or, in medical charge of a colony where the number of commissioned officers and enlisted men is 1500 and upwards, 5s. daily.

Apothecaries.—Daily pay: apothecaries 9s., after five years' service 10s. 6d., after ten years' service 12s., after fifteen years' service 13s. 6d., after twenty years' service 15s., after twenty-five years' service 16s. 6d., after thirty years' service 18s.

Assistant-surgeons shall, as a general rule, be promoted to the rank of surgeon in the order of their seniority in the service, unless unfit for the discharge of their duties from physical or professional incompetence or misconduct. In cases of distinguished service, however, an assistant-surgeon may be promoted without reference to seniority; and in such cases, the recommendation detailing the services for which the officer is proposed for promotion shall be published in the general orders of the army, and in the *Gazette* in which such promotion shall appear.

A surgeon, after twenty years' service in any rank, shall be styled surgeon-major, but a surgeon of less than twenty years' full-pay service may be promoted to the rank of surgeon-major for distinguished service. The recommendation detailing the services for which the officer is proposed for promotion for distinguished service shall be published in the general orders of the army, and in the *Gazette* in which such promotion shall appear.

A surgeon must have served ten years in our army, with a commission on full pay, of which period two years must have been passed, with the rank of surgeon, in or with a regiment or depôt battalion, before he can be promoted to the rank of deputy inspector-general of hospitals.

All promotion from the rank of surgeon or surgeon-major to that of deputy-inspector, and from the rank of deputy-inspector to that of inspector, shall be given by selection for ability and merit, the selection being made from the whole rank of surgeons, whether styled surgeons or surgeons-major; and the grounds of such selection shall be stated to us in writing, and recorded in the office of our Commander-in-Chief.

A deputy inspector-general of hospitals must have served five years at home, or three abroad, in that rank, before he can be promoted to the rank of inspector-general.

Our Secretary of State for War, in cases of emergency, may shorten the several periods of service above mentioned, as he shall deem expedient for the good of our service.

Good Service Pensions shall be awarded to the most meritorious medical officers of our army, under such regulations as shall be from time to time determined by us, with the advice of our Secretary of State for War. Six of the most meritorious medical officers of our army shall be named our honorary physicians, and six our honorary surgeons.

Medical officers shall have the right to retire on half-pay after 20 years' service; medical officers of the rank of surgeon-major, surgeon, or assistant-surgeon, shall be placed on the retired list at the age of 55, and all inspectors-general and deputy inspectors-general at the age of 65 years.

Our Secretary of State for War may, when he shall deem it fit, employ officers of the medical branch of our hospital department in sundry situations, at such daily rates of pay, in addition to half-pay, as he shall from time to time determine.

A medical officer who, having voluntarily resigned his commission, has subsequently been permitted to re-enter the army, shall not, except under very special circumstances to be approved by our Secretary of State for War, be allowed to reckon his former service.

An apothecary shall have the right to retire on half-pay after 30 years' good service.

Non-effective Pay.—A medical officer placed on half-pay by reduction of establishment, or on the report of a medical board in consequence of wounds or ill-health caused in and by the discharge of his duties, or on account of age, shall be entitled to half-pay at the following daily rates:—Inspector-general, after thirty years' service, £1, 17s. 6d.; twenty-five years, £1, 13s. 6d.; twenty years, £1, 10s. Deputy inspector-general, after thirty years, £1, 5s. 6d.; twenty-five years, £1, 2s. 6d.; twenty years, £1, 1s. Surgeon-major, after fifteen years, £1; twenty years, 16s. 6d. Surgeon, after fifteen years, 13s. 6d.; ten years, 11s. Assistant-surgeon, after ten years, 10s.; five years, 8s.; under five years, 6s.

The rate of half-pay awarded to officers retiring for their own convenience, after twenty years' service on full-pay, shall not exceed one-half of their full-pay at the time of retirement.

ARMY MEDICAL SCHOOL.

ROYAL VICTORIA HOSPITAL, NETLEY.

President of the Senate.—Sir T. Galbraith Logan, K.C.B., M.D., Director-General of the Army Medical Department.

Members of the Senate.—Sir Ranald Martin, C.B., Physician to the Indian Council; Inspector-General G. S. Beatson, M.D., Principal Medical Officer, Royal Victoria Hospital; Deputy-Inspector-General T. Longmore, C.B., Professor of Military Surgery; Deputy-Inspector-General W. C. Maclean, Professor of Military Medicine; William Aitken, M.D., Professor of Pathology; E. A. Parkes, M.D., F.R.S., Professor of Military Hygiene.

Assistant Professors.—Staff-Surgeon-Major W. A. Mackinnon, C.B., Military Surgery; Staff-Surgeon-Major, W. J. Fyffe, M.D., Military Medicine; Staff-Surgeon F. S. B. F. De Chaumont, M.D., Military Hygiene; and Staff-Assistant-Surgeon V. Wearne, Pathology.

Candidates for Commissions in the Army, and in the Queen's Indian Service, proceed to Netley after passing the Examination at London. At Netley they attend the Medical and Surgical Practice of the Royal Victoria Hospital, and learn the system and arrangements of Military Hospitals. During four months they attend the lectures given by the Professors and Assistant-Professors, and go through a course of practical instruction in the Hygienic Laboratory and Microscopical Room. The lectures and practical instruction are intended to explain the specialities of Military Medical Practice, attention being directed to gunshot and other wounds, surgical arrangements in the field during action and sieges, means of transport, field hospitals, tropical diseases and their means of investigation, service in India and in the various colonies, the sanitary arrangements in peace and war, and the means of carrying out the sanitary regulations. Every opportunity is taken of practising operations on the dead body, and practical points of a like kind.

INDIAN MEDICAL SERVICE.

INDIA OFFICE, WHITEHALL, S.W.

ALL natural-born subjects of Her Majesty between twenty-two and twenty-eight years of age at the date of the examination, and of sound bodily health, may be candidates for the appointment of assistant-surgeon in Her Majesty's Indian Medical Service.

They must subscribe and send in to the Military Secretary, India Office, Westminster, proofs of their qualification similar to those required by the Army Medical Department.

Degrees, diplomas, licenses, and certificates of their registration in accordance with the Medical Act of 1858, must be lodged at the India Office, for examination and registry, at least one fortnight before the candidate appears for examination. The regulations, subjects, and times for examination are the same as for the Army Medical Department. Passage allowance to India on appointment will be given, or a passage provided. When passages are provided on board the Indian troop-ships, a charge for messing will be made at the rate laid down in the Royal Passage Warrant of 1865. Pay at 10s. a day will be allowed from the date of passing final examination at the Army Medical School.

Indian allowances and time of service for pension will reckon from date of arrival in India. The period of residence at the Army Medical School will reckon as service for the full-pay pension only.

The duties will be those hitherto performed by the medical officers of the East India Company's Service, with the exception of those relating to European troops.

Surgical instruments are provided in India by the Government for the use of medical officers.

When assistant-surgeons have served the requisite time they will be examined in the following manner as a test for promotion:—

A series of printed questions, prepared by the Inspector-General of the Presidency, will be sealed and sent to the principal medical officers of stations where assistant-surgeons may be eligible for examination. It will be the duty of the principal medical officer of the station to deliver these sealed questions to the assistant-surgeons, and to see that they are answered without the assistance of books, notes, or communication with any other person. The answers are to be signed, and delivered sealed to the principal medical officer, who is to send them, unopened, to the Inspector-General of the Presidency, together with a certificate from the surgeon of the regiment, or other superior medical officer, that the assistant-surgeon has availed himself of every opportunity of practising surgical operations on the dead body.[1]

The assistant-surgeon will also be required to transmit, together with his answers to the Inspector-General of the Presidency, a medico-topographical account of the station where he may happen to be at the time, or of some other station where he may have been resident sufficiently long to enable him to collect the necessary information for such a report. Failing this, he will send a medico-statistical report of his regiment for a period of at least twelve months.

If the Inspector-General of the Presidency is satisfied with the replies to the questions, and with the certificates and medico-topographical or statistical report, the assistant-surgeon will be held qualified for promotion.

The assistant-surgeon will thus be subjected to three separate examinations within the first ten years of his service, each examination having a definite object. The first, to ascertain, previous to his admission into the service as a candidate, his scientific and professional education, and to test his acquirements in the various branches of professional knowledge; the second, after having passed through a course of special instruction in the Army Medical School, to test his knowledge of the special duties of an army medical officer; and the third, previous to his promotion, to ascertain that he has kept pace with the progress of medical science.

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[1] The assistant-surgeon may see this certificate before it is sent to the Inspector-General.

The promotion of assistant-surgeons will be regulated by length of service, and not, as heretofore, by succession to vacancies in a fixed establishment of officers of the higher grades.

Assistant-surgeons of twelve years' service from the date of first commission (of which two years shall have been passed in charge of a native regiment), who shall have passed the prescribed examination in professional subjects, will be promoted to the rank of surgeon.

A surgeon, whether on the staff or attached to regiments, must have served ten years in India, of which two must have been passed, with the rank of surgeon, in or with a regiment, or as a civil surgeon, before he will be eligible for promotion to the rank of deputy inspector-general of hospitals.

A deputy inspector-general of hospitals must have served three years in India as such before he shall be eligible for promotion to the rank of inspector general.

In cases, however, of emergency, or when the good of the service renders such alteration desirable, it shall be competent for the Governor-General in Council to shorten the several periods of service above mentioned, in such manner as he shall deem fit and expedient.

With a view to maintain the efficiency of the service, all medical officers below the rank of deputy inspector-general of hospitals shall be placed on the retired list when they shall have attained the age of fifty-five years, and all inspectors-general and deputy inspectors-general when they shall have attained the age of sixty-five years.

With a view of promoting the efficiency of the service, it has been further determined that the tenure of office by a deputy inspector-general shall, as in the case of inspectors-general, be limited to five years; officers being, however, if not disqualified by age, eligible either for employment for a second tour of duty in the same grade, or for employment in the higher grade of inspector-general by promotion thereto.

The rank of inspector-general and deputy inspector-general conferred upon officers of the Indian Medical Service under the royal warrant of 13th January 1860 is to be considered as substantive rank.

These officers, on vacating office at the expiration of the five years' tour of duty, will be permitted in future to draw respectively an unemployed salary of 1200 rupees per mensem in the former, and 900 rupees in the latter case, for a period of six months from the date of their vacating office, after which they will be placed while unemployed on the rate of pay laid down for officers of corresponding rank in Europe. These sums, deducted from the consolidated salary, will regulate the moiety of staff salary to be drawn by officers of those grades during absence on sick certificate.

NAVY MEDICAL DEPARTMENT.

Admiralty Office, Somerset House, London, W.C.

REGULATIONS RELATIVE TO THE EXAMINATION OF CANDIDATES FOR THE APPOINTMENT OF ASSISTANT-SURGEON IN THE ROYAL NAVY.

1. That a candidate for entry into the Royal Navy shall make a written application to that effect, addressed to the Secretary of the Admiralty, on the receipt of which application he will be furnished with the regulations, and a printed form, to be filled up by him, to show if he possesses the required qualification.

2. As vacancies occur, the number of candidates required will be ordered to attend for competitive examination at the Admiralty Office; but it is to be observed, that no person can be admitted as an assistant-surgeon in the Royal Navy unless he can produce satisfactory evidence that his name has been placed on the Medical Register as legally qualified to practise both Medicine and Surgery according to the Regulations established by the Medical Act. And further, he will be required to make a declaration that he is free from any

mental or bodily disease, defect, or infirmity, which could interfere with the efficient discharge of his duties as a medical officer in the Navy.[1]

3. Each candidate will be required to produce a certificate of good moral character, signed by the clergyman of the parish, or by the magistrate of the district, or by a legally qualified physician or surgeon.

4. A certificate that he is not less than twenty nor more than twenty-eight years of age.

5. That he has received a preliminary classical education.

6. That subsequently to the age of eighteen he has actually attended a recognised hospital for eighteen months, in which the average number of patients is not less than one hundred.

7. That he has been engaged in actual dissection for twelve months, and that he has performed the principal capital and minor operations on the dead body under a qualified teacher. The certificates of Practical Anatomy must state the number of subjects or parts dissected by the candidate.

8. On producing the above certificates, he will be examined on the following subjects, viz.:—Anatomy, Surgery, Physiology or Institutes of Medicine, Practice of Medicine, Chemistry, Materia Medica, Midwifery, Botany.

9. Although the above are the only qualifications which are absolutely required in candidates for the appointment of assistant-surgeon, a favourable consideration will be given to those who are acquainted with the collateral sciences more immediately connected with the profession, such as Natural History, Natural Philosophy, and the use of the microscope in diagnosis.

10. Such candidates as shall have been found in all respects competent for the appointment of assistant-surgeon will be forthwith nominated to one of Her Majesty's Ships, or to a Naval Hospital at home; or, should their services not be immediately required, their names will be duly registered for early appointments as vacancies may occur. But it is distinctly to be observed, that candidates admitted into the Naval Medical Service must serve in any ship to which they may be appointed; and that in the event of their being unable to do so from sea-sickness, their names cannot be continued on the Naval Medical List, nor can they, of course, be allowed half-pay.

11. By the rules of the service no assistant-surgeon can be promoted to the rank of surgeon until he shall have served five years, two of which must have been in a ship actually employed at sea, after which he will be required to pass an examination before a Board of Naval Medical Officers, assembled at the department of the Medical Director-General of the Navy.

12. After completing three years' full pay service, assistant-surgeons will be allowed to be examined for the rank of surgeon, but no assistant-surgeon can be promoted to the rank of surgeon until he shall have served five years, two of which must have been in a ship actually employed at sea.

13. A limited number of those candidates who pass the best examination on entering the service shall be promoted annually to the rank of surgeon at an earlier period than would occur under ordinary circumstances; and these promotions shall be awarded as follows:—The candidate who passes the best examination of his year—after five years' service. The candidate who passes the second best examination of his year—after six years' service. The candidate who passes the third best examination of his year—after seven years' service. Provided, however, that their second examinations are passed in an equally creditable manner, and that their conduct during the whole time they have been in the service has in all respects been satisfactory.

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[1] His physical fitness will be determined by a Board of Medical Officers, who will be required to certify that his vision is sufficiently good to enable him to perform any surgical operation without the aid of glasses, and that he is free from organic disease, constitutional weakness, or other disability likely to unfit him for naval service in any climate.

Part Third.

PERISCOPE.

Ergotine as a Hæmostatic.—The *Bulletin Général de Thérapeutique* quotes from the *British Medical Journal* a case of Dr Jamieson, of Berwick, in which the subcutaneous injection of ergotine proved successful in arresting pulmonary hæmorrhage on three separate occasions in a man aged forty-one. The *Bulletin Général*, following Dr Jamieson, ascribes the first idea of this excellent mode of employing ergotine as a hæmostatic to Dr G. W. Balfour. The proposal, however, came originally from Langenbeck, of Berlin. Whenever the hæmorrhage is of such a nature that it can be arrested by simple contraction of the smaller arteries, good ergotine is, when thus employed, sure to be successful; and as the subcutaneous injection into the arm, or some fleshy part, is productive of not the slightest inconvenience, it is always worthy of trial. Three to six grains are sufficient for one injection, and it may be repeated within three minutes if necessary; the action is almost instantaneous. A prepared solution may be kept in readiness with a small proportion of spirit or glycerine to preserve it.

General Neuralgia.—M. Gallard has found that the only remedy capable of successfully combating the general neuralgia of Valleix is the actual cautery lightly applied at a white heat along the course of all the nerves affected. Coupled with a tonic regimen he thus cured two cases—one in eight days, and the other in three weeks, after all other means had failed.—*Journ. de Méd. et de Chir. prat.*, July 1870, and *Bulletin Général de Thérap.*, August 1871.

Chloride of Sodium.—As a succedaneum for quinine, Dr Pioch has found the chloride of sodium extremely useful in curing African intermittents. Given by itself, it was occasionally perfectly successful. In some cases a slight return was perceived for three or four days, which yielded, however, to a continuance of the treatment in a few—three or four—days. Others who thought themselves cured after two doses had a less obstinate relapse about eight days afterwards. In a few the attack changed its hour of return, and became gradually feebler before finally disappearing. Those who combined the saline treatment with quinine were rapidly cured, even a grain or two of quinine proving sufficient for this, especially if the quinine were administered seven hours before the access, and the salt one or two hours after the commencement of sweating. The dose of salt is ten grammes (154 grs.) given in half a wineglassful of water. More water causes the salt to purge, and deprives it of its antiperiodic power. Dr P. thinks that the salt acts best in large crystals, and when not pulverized previously. Any coexisting gastric disorder, with or without diarrhœa, must be first removed by a purge. Two doses of ten grammes of the chloride of sodium must be given every day till the desired effect is produced; the first, seven or eight hours previous to the expected access, the second immediately after the pyrexia, if that has not been prevented. Such doses may be continued for three or four days without any physiological inconvenience.—*Lyon Medical*, 1870, and *Bulletin de Thérapeutique*, August 1871.

HYDRATE OF CHLORAL IN INSANITY.—In his last Report of the Royal Glasgow Asylum, Dr Mackintosh makes the following remarks on the hydrate of chloral: "In my last report I alluded to the new drug chloral hydrate, and as we have since used it to a great extent here, I think it proper to state the results of our experience. It has been given principally in the form of syrup, in doses varying from ten to forty grains, rarely exceeding eighty grains, in the course of twenty-four hours. In general, it induces sleep for several hours continuously, and this, too, although taken for a length of time. The patients capable of giving correct answers state that its effects are most soothing and agreeable to their feelings. Some of them are very fond of it; but a common complaint among the melancholics is, that when it does not cause sleep it slightly intoxicates them. In many instances, especially in acute mania, it has completely failed, and markedly so in cases of recurrent mania, where, however, we should add, no kind of medicine seems to abate or arrest the progress of the paroxysm. In the case of some patients it has a tendency to relax the bowels, and never constipates them; it very seldom causes nausea or headache, and the tongue is not found to be dry, as it is after the use of morphia and other sedatives. We must say that we have proved it to be a valuable medicine in cases of insanity and delirium tremens; no bad symptom has been caused by its administration in our practice, and it is more harmless and safe than any other hypnotic known to us."

A NEW TEST FOR HYSTERIA.—A French work just issued by Dr Chairon, Chief Medical Officer to the Vesinet Asylum, entitled "Clinical Studies on Hysteria," announces the discovery by him of a new pathognomonic sign of hysteria, which, should it be confirmed by experience, will prove to be a valuable contribution to medicine. Since Dr Chairon has become connected with this Institution, he has passed under view 26,000 female patients, amongst whom were a great many cases of hysteria. He says that he has ascertained that in every one of them the commencement of the affection has been marked by a special sign—insensibility of the epiglottis. The determination of this system, which is constantly present, is very simple. It is sufficient to introduce gently the finger into the mouth, so as not to frighten the patient, and place it on the base of the tongue. It will be found that the epiglottis may be touched, displaced, and scratched with the nail without producing the least regurgitation. When this symptom exists there will be found invariably a congestion of one or both ovaries, usually of the left. Singular as this proposition is, the author proceeds to prove its exactitude, and has, with that object, quoted a great number of cases collected at Vesinet.—*Philadelphia Med. and Surg. Rep.*, July 29.

DIPHTHERIA OF THE THROAT.—Dr A. Classen, of Rostock, considers (*Virchow's Archiv*, Feb. 1871) that diphtheria is primarily a local disease, and that it depends on a fungus which penetrates into the epithelial cells of the mucous membrane. The result of this penetration of the epithelial cells by the fungus is a greatly increased growth of epithelium, so that layers on layers of such cells are produced, and, at the same time, white and red blood-corpuscles pass from the vessels and mix with the diseased part. The exudation in diphtheria he considers to be composed chiefly of the changed epithelial cells and blood and pus corpuscles. The fungus he has detected in the very substance of the epithelial cells, and, as it is extremely minute, he supposes that it passes from the affected membrane into the bloodvessels, and there produces the constitutional symptoms, which are thus secondary to the primary affection of the mucous membrane. The presence of the fungus in the mucous membrane leads to irritation and inflammation of it, and the inflammation has the usual results; and as it is generally severe, it is commonly followed by sloughing of the mucous membrane. The author distinguishes diphtheria from croup on the one hand clinically, but on the other hand more absolutely, on the ground of the presence of this fungus in diphtheria. In the early stages of diphtheria you may have only a false membrane on the surface of the mucous membrane, but this has its origin in the irritation produced by the fungus; whereas in croup there is always a simple inflammation, which is not generally so severe as that which occurs in diphtheria, and the mucous membrane is not generally involved in the exudation. In diphtheria the constitutional disturbance is greater than in croup, this being a natural result from the fungus passing into the blood. The alteration in the constitution of the blood effected by this fungus is considered to produce a tendency to hæmorrhage, and the paralysis which is one of the common results of diphtheria is ascribed to hæmorrhage into the sheaths of the nerves. To the same cause he ascribes the difficulty of hearing and seeing which sometimes ensues, and supposes that when hæmorrhage has occurred a slight inflammation is set up as a consequence, and that the function of the nerve is thus interfered with. A case is described where there was some loss of sight, and ophthalmoscopic examination showed the presence of a slight degree of neuro-retinitis, and this the author ascribes to the inflammation resulting from hæmorrhage into the optic nerve near its origin. In respect to therapeutics, the author, considering the disease to be primarily a local one, and this local affection depending on a foreign organism, looks on the destruction of the latter as the most obvious indication. Practitioners have come, as a rule, to use local applications to cases of diphtheria, without any definite idea as to the disease being fundamentally local. The author has used various local applications, and here gives the result of his experience: Nitrate of silver, in solution or solid, is not advisable, as its action is too superficial; the solution of the perchloride of iron is useful in slight cases; but he considers that the mild acids are the best agents. He has used diluted lactic acid, which he paints on to the part; also citric acid, in the form of lemons, which were sucked in large quantities, sometimes to the number of seventy in the twenty-four hours. The acid he has found most reliable, however, is sulphurous acid, and this he administers in the form of dry powdered sulphur (flowers of sulphur) blown on to the part, or suspended in water and used as a gargle. The grains of sulphur adhere to the mucous membrane, and by their gradual oxidation form a continual store of sulphurous acid. The constitutional treatment was varied according to the cases; in some cases leeches were used; and, where the exudation was extremely extensive, mercury was given in the form of mercurial inunction. Quinia and iron were most useful in convalescence. Latterly, he has given crystallized carbolic acid, with a view to its attacking the fungus in the blood, and he thinks he has seen great benefit derived from its use.—*Glasgow Med. Jour.*, May 1871.

PERFORATION OF THE UTERINE WALLS BY A SOUND.—Dr Alt, in his Gynæcological Clinic (*Centblt. f. d. Medicinisch. Wisschftn.*, 10th Dec. 1870, from *Berliner Klin. Wochenschr.*, No. 42, 1870), describes two cases, occurring in newly-confined women, in which a sound was passed into the uterus far beyond the customary depth—17 to 13 cm. respectively. No hæmorrhage followed in either case, nor any symptoms of peritoneal disease. Dr A. concurs in opinion with Hœnig, that in both the above cases there occurred a perforation by the sound of the walls of the uterus, which can readily take place, without the employment of any objectionable force in the use of the instrument, when the uterus is in an atrophied condition—a common occurrence in the puerperal state. The explanation given by Matthews Duncan and Hildebrand of the character of these cases—namely, that the sound passes into the abdomen through one of the Fallopian tubes—is shown by Dr Hœnig, in his analysis of the cases on record, to be untenable; but more especially is the incorrectness of the opinion proved by the observations reported by Dr E. Martin, in the second edition of his work on *Displacement and Curvatures of the Uterus*. On laying open the abdomen in one of the cases similar to those reported by Dr A., he actually saw that the sound had passed into the abdominal cavity through the wall of the uterus.—*American Jour. of the Med. Sciences*, July 1871.

Part Fourth.

MEDICAL NEWS.

Obituary.—On the 31st of August last, Henry Hyde Salter, M.D., F.R.S., died, after a long and lingering illness, which terminated in a suppurating cavity in the apex of his right lung. Dr Salter is well known for his work upon Asthma, his researches on that subject having been stimulated by the fact that he himself had suffered from it from childhood. Dr Salter was also the author of various scattered lectures on clinical medicine, chiefly on the thoracic organs; and he edited the last two volumes of the "Encyclopædia of Anatomy and Physiology," besides contributing to them the articles "Tongue" and "Pancreas," the former of which especially contained many novel anatomical observations; and it is believed that his election as a Fellow of the Royal Society at the early age of thirty-three was mainly due to this paper. Dr Salter has died at the age of forty-seven, affording another sad illustration of the apparent incompatibility of active mental exertion with long life in the metropolitan atmosphere.

The Medical Directory.—The Editors of this most useful publication have requested us to announce that, in the forthcoming edition, the name of no one will be inserted who does not possess a legal qualification capable of being registered. Actual registration is not a necessary condition of insertion in the *Medical Directory*, but the qualifications possessed must be such as the registrars would receive. This is a very commendable resolution, and will prove useful in as far as possible keeping out all illegal practitioners.

Medico-Chirurgical Society of Glasgow.—At the meeting of this Society, held on Friday, 1st September, in the hall of the Faculty of Physicians and Surgeons, the following gentlemen were elected office-bearers for the ensuing session, viz. :—

President.—Dr James Adams.
Vice-Presidents.—Dr James Stewart, Dr George Buchanan.
Council.—Mr Torrance, Airdrie; Dr H. Thomson, Dr James Gray, Mr Robert Grieve, Mr J. Pollock, Mearns; Dr R. Renfrew, Dr George Miller, Dr T. D. Buchanan.
Secretaries.—Dr Robert Perry, Dr Alex. Robertson.
Treasurer.—Dr H. R. Howatt.

Cholera still prevails to a considerable extent in the east of Prussia, and is even said to be intruding southwards into Turkey.

Hartlepool seems to be the port most menaced in Britain, as already there have been two seamen ill of cholera landed there, one from the *Uhlenherst*, and the other from the *Alster*, both steamers from Hamburg. We see nothing in the characteristics of the season, or the signs of the times, to induce us to believe in an impending epidemic of cholera, and we trust nothing of the kind will happen; for, difficult as it has always been to get cholera patients properly attended to, it would be ten times worse after all this fuss about quarantine. Considering the filthy condition of our towns, with all its ills, quarantine is perhaps a necessary evil; but it would certainly be a loss to mankind were quarantine alone always to be successful in keeping out such preventible diseases. Our duty is clearly to watch the seaboard, but also to set our own house in order, and, by promoting the sanitary condition of our people and our towns, to defy the cholera, just as we have for long defied the plague, which has not ceased to exist, though it now never comes hither.

Diphtheria has again proved fatal in fourteen cases in Edinburgh during August, mostly in the well-to-do districts. Glasgow and Edinburgh, the two towns best drained and best supplied with water, have this month proved the most prolific of diphtheria, pre-eminently, as we believe, a foul-air disease. Clearly, good drainage and ample water-supply are not panaceas for the prevention of such diseases. Surely our indefatigable Health Officer ought to have something to say of this. Eighty deaths from diphtheria in five months is surely a heavy item for a preventible disease.

Presentation to Dr Paxton.—On the 30th ult. a deputation from the people employed at Caprington Works waited upon the above-named gentleman and presented him with a massive silver salver in recognition of his long and valuable services as their medical officer. The salver, which is of solid silver, and of the most chaste and elegant design and beautiful workmanship, bears the following inscription:—"Presented to John Paxton, M.D., Kilmarnock, by the employées at Caprington Works, on the occasion of his retiring as their medical officer, after a faithful professional attendance of thirty-five years. Caprington, 1871." We understand that a recent severe illness, from which the doctor has not even yet fully recovered, compelled him to sever the tie which had so long and agreeably existed between the Caprington workers and himself. But this token of regard with which they presented him so gracefully and spontaneously will be an abiding evidence to him how far they appreciated his anxiety and desire to discharge his onerous duties towards them faithfully and well.—*Kilmarnock Standard*, Sept. 2.

The best method of Preserving Eggs is to coat them with collodion.

APPOINTMENT.—We are glad to learn that Dr H. Alleyne Nicholson, formerly Lecturer on Natural History in the Medical School of Edinburgh, has been appointed to the Chair of Natural History in the University of Toronto.

THE BEST METHOD OF DESTROYING BUGS is to wash the woodwork infected by these vermin with a solution of carbolic acid in water of the strength of five parts of the acid to one hundred of water. The insects are at once killed by the solution, which also acts as a disinfectant.—*Révue de Thérapeutique Médico-Chirurgicale*, 1st August 1871.

LIST OF GENTLEMEN who competed successfully for appointments as Assistant-Surgeons in her Majesty's British Medical Service at the Competitive Examination held at the London University on the 9th August 1871.

Order of Merit.	*Name.*	*Marks.*	*Order of Merit.*	*Name.*	*Marks.*
1.	Cottle, E. W.	2060	8.	Bridges, W. P.	1875
2.	Connolly, P. S.	2055	9.	Rogers, J. G.	1865
3.	Dwyer, C. E.	2020	10.	Ash, R. V.	1825
4.	Blood, R.	1970	11.	Grant, W. C.	1782
5.	Fasken, W. A. D.	1959	12.	Connolly, B. B.	1720
6.	Edge, J. D.	1890	13.	Barrow, H. J. W.	1665
7.	Drury, R.	1885	14.	Barrow, F. E.	1654

PUBLICATIONS RECEIVED.

William Adams, F.R.C.S.,—New Operation for Bony Anchylosis of the Hip-Joint. London, 1871.

M.A.B.,—Some Simple Sanitary Precautions against Cholera and Diarrhœa. London, 1871.

Samuel C. Busey, M.D.,—Artificial Induction of Labour in Uræmia. Washington, 1871.

Robert H. Collyer, M.D.,—Mysteries of the Vital Element. London, 1871.

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Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*The Restoration of the Perineum.* By J. MATTHEWS DUNCAN, M.D.

THE operation which I now propose to describe has received various names. That which I use, and which forms the title to this paper, is open to some objections—and yet, I prefer it because it indicates the chief object of the proceeding. The perineum may be restored in order that it may aid in closing the vagina, and prevent, or assist in preventing, the procidence of the womb, or of other pelvic organs. The perineum may be restored because its restoration implies the reconstruction of the anus, and restoration of the function of the sphincter ani. But the name is not in every sense apt, for in many cases the operation is performed on an anatomically entire perineum. When procidentia occurs in a virgin, for example, and demands this operation, as it occasionally does, then the surgical interference has not for its object the anatomical restoration of the perineum, but the formation of a new, adventitious, or supplementary perineum, in addition to, or continuation of, the old or present one, whose mechanical function of closing the lower part of the vagina has been impaired or lost, or at any rate requires to be improved or added to. The restoration of the perineum may imply, then, not merely what the name sufficiently indicates, but the formation of new perineum in addition to what may be present, whether that is partly damaged anatomically or entirely uninjured anatomically.

When the perineum is ruptured in the course of the second stage of labour, or otherwise, as in the analogous extraction of a large fibrous tumour of the womb, almost no evil is thereby entailed on the woman if she is in other respects healthy, unless the injury reaches the sphincter ani.

If the laceration goes no farther than to reach the anal opening, the woman may suffer little inconvenience from it. But she is always liable to inconvenience, and perhaps also to disease. The lower or external part of the sphincter is divided, and the function of the whole muscle is imperfectly performed. This imperfection may not be felt if the alvine dejections are of considerable or ordinary consistence, and if there is no flatus in the rectum. But if there be flatulence, it may be discharged on untimely occasions; and noise, or fetor, or both, may accompany the discharge, and be extremely offensive. If there is diarrhœa, or if there is merely a loose condition of the bowels, then the stool may pass without the patient's knowledge; or, if not without her knowledge, without her being able even for a minute to impede its expulsion. This condition of incomplete destruction of the sphincter is not uncommon, and many women, even women of refinement, endure its evils rather than submit to the operation for its cure. The same condition is occasionally observed in cases of lupus of the vulva, the destruction of the sphincter being the result of intractable ulceration. I have seen, in a case of lupus, this condition simulated functionally, while anatomically the whole sphincter, and almost the whole posterior wall of the vagina and adjacent rectum, were destroyed and removed. In this case, the new anus, lying behind the cervix uteri, and opening into a great recto-vaginal cloaca, had, instead of a sphincter, a hard cicatricial stricture, which allowed only a finger to permeate it, and which acted nearly as well as the sphincter ani when incompletely destroyed by laceration in the second stage of parturition.

The imperfect action of the sphincter ani, entailing the evils we have just been describing, is sometimes observed even when the muscle is entire, as in men. It may be a temporary weakness, or an early stage of the more complete paralysis of the sphincter.

Women suffering from injury of the sphincter ani, I am inclined to think specially liable to a peculiar form of diarrhœa. At least, I have observed the occurrence of a peculiar, chronic, slight looseness of the bowels in such women so often as to lead me to believe in some obscure connexion between the two conditions. At the same time, I cannot but remark an evident source of danger of error so long as there are no statistical data to confirm or overthrow the opinion: this source of danger, or the false appearance of extraordinary frequency of this diarrhœa, may arise from the extraordinary annoyance which it produces in women with imperfect sphincters, and the consequent extraordinary impulse to call for medical or surgical relief. The disease to which I have been alluding causes much dull griping pain, coming on generally after taking food, and most frequently after breakfast, and followed by frequent evacuations, the dejecta being nearly watery in consistence. It is not amenable to any treatment by drugs, except for a time. Brandy, strychnine, iron, and bael, are the remedies which I have found to be of at least temporary utility. I have not observed disorder of the stomach, or derangement of nutrition, to result, even from a long continuance of the disorder.

When the whole sphincter is destroyed, and there is no compensating stricture of the rectum at its opening into or union with the vagina, the woman's condition is always truly pitiful. The patient has not only no power of retaining the fæces, whether solid or fluid—she is not even aware of their coming to pass till her person and clothing are disgustingly soiled. She has no chance of ease or comfort, even temporarily, except from a successful operation for the restoration of the perineum.

In cases of procidentia of the bladder, of the uterus, of the posterior wall of the vagina, of the rectum, of several or of all of these parts, the perineum may be anatomically entire, the hymen may be easily traced without a laceration; or there may be more or less complete anatomical destruction of it, laceration having proceeded to various degrees, backwards from the fourchette towards the anus, or even into the recto-vaginal septum. This line of parts is most, though not exclusively, liable to laceration during parturition, for two reasons: first, because it is the line of greatest thinness of structure, and of greatest weakness; second, because, holding the position of the concavity of the curved tube through which the head is pushed, it is, in accordance with physical law, the part most subjected to dangerous pressure by the efficient powers of parturition. In cases where I have observed the hymen unruptured it has been pale and thick, and has probably owed its entire condition to the gradualness of the distention to which it has been subjected.

In cases of procidentia, whether the perineum be anatomically entire or not, it is always functionally imperfect. It does not prevent the passage of the procident organ or organs over it and through the vaginal orifice, as it might do. It is gradually distended, the vaginal orifice is dilated, the perineum or its remnant is pushed backwards, and its antero-posterior length is more or less completely annihilated. In this way, cases which begin with an entire perineum are at length brought, not anatomically, but functionally, into the same condition as those in which the perineum was previously extensively ruptured. When the procident parts are pushed back, and the perineal region is exposed, there is found a very unnatural condition of parts. Instead of the labia majora being in contact, or nearly so, there is seen a large rounded gaping vaginal orifice, generally closed by the rugous anterior vaginal wall, and extending from the clitoris in front to the narrow transverse strip of perineum behind. This condition cannot but cause symptoms, and accordingly the woman describes a feeling of disagreeable openness. This gaping orifice the surgeon closes by restoring the perineum, making a new and long perineum anatomically, with the hope that it will efficiently assume the function of closing this orifice, so as to prevent the return of the procidentia. After the operation is finished, and again after the cure is complete, the surgeon finds, when he exposes the perineal region, a quite different appearance. There is now no gaping orifice; no mucous membrane is visible; the labia majora are in contact—indeed they are extensively united.

The operation which I now propose to describe is very generally successful. Success, indeed, may be counted upon. It is rarely that a second operation is required. I have operated on cases for the second time, but not in any case which was from the first under my own care. Previous failure does not prevent future success.

When the operation is performed for injury of the sphincter, the woman feels her renewed power to restrain flatus and fæces however liquid. This renewed power is not in every case complete; for it occasionally happens, that although there is great improvement, and consciousness of regained sphincteric power, yet the recovery is not quite perfect; the control over feculent and flatulent evacuation is not in its pristine perfection.

When the operation is performed for the cure of procidentia, the cure is complete or the failure is complete. This does not imply that a bandage is not a judicious and advantageous application to aid the restored perineum to do its work of restraining the advance of the organ which tends to fall out. The cure is complete, I have said, and it is a cure of which the surgeon may be proud. The cure is not only often complete, but also permanent. In illustration I may cite a case, and it is not of a rare kind. A multiparous woman, whose employment keeps her almost constantly standing, walking about, stooping, and lifting weights, had a large procidentia. She was operated on and cured by a colleague. The cure lasted a long time. She had again a child. The cure still lasted. Again she had a child, and soon after this the womb came down as badly as ever. The restored perineum was still anatomically entire; the cicatrix of the first operation could be traced; but its restraining function was lost: it was thin and relaxed. The operation was repeated. About three weeks afterwards she returned to her arduous employment, and was and now is quite cured. As her husband is dead, it may be hoped that the cure is for life.

What is the proportional number of failures and of successes after this operation I cannot tell. It is a proceeding to which I frequently resort, but I have found it impossible to trace the subsequent histories of the great majority of my patients. The sufferers from aggravated procidentia are for the most part very poor women, whose hard lives and frequent changes of residence form some excuse for their failing to fulfil promises to keep the surgeon informed as to how they are "getting on."

I have just mentioned a case in which the restored perineum continued entire after two births at the full time. The retaining function of the perineum was, in that instance, destroyed, not by laceration, but by distention. I have repeatedly seen cases in which the birth ef a mature child did not extensively or injuriously lacerate a restored perineum.

The operation runs great risk of failing from disorder of the healing process, the opposed raw surfaces secreting pus instead of uniting, if the subject of it is very old, if she is of syphilitic constitution, or if the parts are the subject of recent or of chronic inflammation. Of course, under these conditions, it should not be attempted.

In cases of laceration of the perineum the operation may be undertaken at the time of the accident or after the injured parts are quite healed. I have done it successfully at both times, and if circumstances are all favourable I would recommend its performance at the time of the accident. Yet I think a successful result can be more securely predicated of a delayed operation than of an operation done at the time of the injury. It is to be remembered that the perineum often appears to the inexperienced to be extensively injured during labour, and so as to demand operative interference, when truly very little harm has been done; as is made apparent by examination after the parts are healed.

The instruments required for the operation are the following:—a sharp bistoury, a dissecting forceps, a catch forceps, ligatures for arteries, needles armed with silver wire for stitching, and a scissors. Besides these, the ordinary appliances for all operations must be at hand, as sponges, etc.

The operation should be done soon after a monthly period has passed; and, in preparation for it, the bowels should be freely evacuated. On the morning of the operation the patient should have only soup or some light nourishment, in order that the vomiting so frequently accompanying and following the induction of anæsthesia, which is maintained during the operation, may be kept within the narrowest bounds.

In describing the operation, I shall suppose the case to be one of laceration of the perineum, the fissure extending through the sphincter ani. It will be unnecessary to go over the steps of the operation for procidentia, because, *mutatis mutandis*, they are quite the same as in a case of laceration.

The patient is placed and held in the position for lithotomy, and the surgeon is placed as he is during that operation. With his fingers or with forceps he seizes the fourchette, or that part which corresponds to it, transfixes it with the bistoury, and then continues to cut, first on the one side and then on the other, upwards from the fourchette or its representative as far as he deems necessary. In cases of procidentia it is usual to make the raw advance as far forward as to be nearly on a level with the orifice of the urethra. The operator thus removes a long tape-like piece of integument, which is about half an inch broad, rather less than more; and he leaves a horseshoe-shaped wound in which the point of the shoe is at the fourchette. It is important that the proper piece of integument should be removed, and it is at some parts a matter of care to secure this. At the fourchette there is little difficulty. It is quite easily made out, or may be made to project by separating the labia. Farther forwards on the sides of the vaginal orifice, the junction of skin and mucous membrane is sought for as the line of the wound, and it is not always quite easily found. The anterior margin of the wound is at or involves the posterior extremity of each nympha, and the line of the wound runs between this and the fourchette, its course being sometimes marked by the opening of the duct of the vulvo-vaginal gland on either side.

Generally two, sometimes four, arteries require ligature. Two of these are in front of the sphincter, one on either side: the other two are generally farther forwards near the nymphæ. A few minutes' delay is now caused by waiting for the complete or nearly complete stoppage of oozing from the raw surface. Then the wound is closed.

A series of silver-wire sutures is passed about one-third of an inch apart. The wire sutures, after being placed, are observed to pass through the wound near its deeper margin, and emerge on the skin or rectal mucous membrane about a third of an inch distant from the outer margin of the wound. Beginning posteriorly, each suture is tied with some firmness, the edges of mucous membrane and of skin being carefully adjusted to one another. Now the bladder is evacuated, the vulva is washed and dressed with some wet lint, and the operation is finished.

The alvine evacuations are stopped for about ten days by daily use of opium in some form. I use solid opium in one-grain pill at bed-time, or oftener if there appears need for it. The patient is fed on light food and sparingly. The urine may be drawn off twice or thrice daily, or the patient may herself make it while lying. The wound requires to be kept clean by daily dressing. Care should be taken that discharge does not accumulate in the vagina.

On the seventh or eighth day after the operation, the stitches are removed. Twenty-four or forty-eight hours afterwards the bowels, if they do not spontaneously move, are acted on by castor-oil.

The removal of the stitches is done as in the operation for vesico-vaginal fistula. A dissecting forceps is made to seize the projecting end of the ligature. and to tighten the loop by traction; then one blade of a sharp-pointed scissors is insinuated within the loop, and the scissors is made to cut it; after which it comes away by the traction of the forceps. But in a case of extensive perineal laceration it is sometimes difficult to get at the deepest or farthest back sutures. They may be half an inch or more within the margin of the new anus, and require considerable care in dealing with them.

Very many different plans for performing this operation have been proposed and practised; and of these many involve proceedings of which I disapprove, such as removing large portions of vaginal mucous membrane, and incising the sphincter ani. The plan I have rapidly sketched has the recommendation of being as simple as possible, and I have had such considerable experience of it as to justify my preferring it on the best grounds as being at the same time very successful and satisfactory.

ARTICLE II.—*On Feigned Diseases, their Detection and Management.* By GEORGE WILSON, M.A., M.B., C.M.; Medical Officer H.M. Convict Prison, Portsmouth; late Medical Officer H.M. Female Prison, Woking; and Assistant-Surgeon H.M. Invalid Prison, Woking.

(*Continued from page* 341.)

THE other feigned diseases of the nervous system which merit special attention are those connected with the brain itself. They may be grouped as follows:—

I. Feigned insanity.
II. Feigned epilepsy.
III. Feigned cephalœa and other cerebral disorders.
IV. Feigned and factitious diseases of the organs of sense.

I. Outside the criminal population I apprehend that insanity is seldom feigned. In prison, however, feigned attempts are of frequent occurrence, and, although usually their detection is not difficult, it is no easy matter to point out such a series of well-marked distinguishing features as will enable one to arrive at a correct diagnosis in every case. Generally speaking, a feigned attack commences without any premonitory symptoms. A prisoner has got himself into trouble, and wishes to evade the consequences; or he has given way to a violent outburst of temper, during which he may have torn up his clothing, and considers it expedient to keep up the excitement in some way. Or, again, he may be undergoing a course of punishment in separate confinement, which he is desirous of cutting short; and in some instances, though I think they are few, he makes the attempt deliberately, and with a view to his being ultimately removed to a lunatic asylum, or to some other prison for observation. But whatever the motive, the simulation, as I have said, is commenced suddenly, and often extravagantly. The malingerer's notion of insanity is so imperfect and erroneous that he believes any course of conduct, provided it be outrageous or nonsensical enough, will be a very credible representation of a real attack, and ought to be recognised as such, if he only perseveres. But it does not occur to him that, having once assumed his part, he ought to play it out consistently. If he breaks out in a violent, noisy, and destructive display, he very speedily becomes exhausted, and betrays himself by indulging in a sound night's rest. If he tries to ape monomania, he will keep repeating some absurd statement which he hopes will be regarded as a delusion, and will rigidly abstain from entering into any conversation, or of answering any question coherently. Should he feign dementia, he will very likely maintain a sullen attitude for some days if allowed to do so, and at the end of that time, or after a shorter interval, take to burlesquing of some kind to relieve the monotony. Hence it is that every attempt at feigning insanity is incongruous, incomplete, and disconnected. The simulator has never any lucid interval, because he believes that if he were to behave rationally for one moment, he would betray himself. He therefore studiously avoids recognition of those around him, disregards any questions which may be put to him, and will rarely look any one in the face. He is fond of stripping himself naked, is sometimes abhorrently filthy in his conduct, and occasionally refuses to take any food for a time. The varieties of insanity to which his imitations bear most resemblance are acute mania, chronic mania with delusions, and dementia. In many cases, however, different phases of the feigned attempt present resemblances—now to one, now to another of these varieties—and this want of coherency, or natural sequence of the phenomena, is in itself an important aid to diagnosis. Of course, in all cases there is an absence of those purely physical symptoms which, in greater or less degree, usually attend genuine attacks of insanity. If, for example, the attempt at the outset resembles an attack of acute mania, the pulse may be rapid from muscular exertion, and the skin moist; but there will be no evidence of febrile disturbances, nor will the skin be clammy, harsh, or dry. The tongue will not be coated, nor can the ceaseless agitation and restlessness characteristic of acute mania, themselves difficult to imitate, be prolonged for many hours; within twenty-four hours at the utmost, the malingerer will have exhausted his energies, and falls into a sound sleep. The diagnosis of a feigned attack of acute mania is, therefore, an easy matter, and I need not adduce cases to illustrate this part of the subject. Of a more puzzling character are those cases which present some of the features of chronic mania, monomania, or dementia; and here a few examples, which have recently come under my own notice, may be of interest:—

CASE 1.—Several weeks ago, prisoner J. S. was admitted into hospital suffering from loss of flesh and general debility. He had a pale dejected appearance, a hydrocephalic-looking head, and widely dilated pupils. He complained of dizziness when at exercise, great weakness, and slight cough, although there were no physical signs of pulmonary disease. His appetite was very good, and he was put on liberal diet, with tonics. He was not of the habitual criminal class; his conduct when in prison had been exemplary, and his behaviour in hospital in every way creditable. In short, he appeared to be one of those cases on which prison-life tells somewhat severely, and gave one the impression that he might also be suffering from nostalgia or home-sickness. He remained under treatment for three weeks; but though he had gained in weight, his appearance still remained pale, his expression languid and apathetic, and his pupils widely dilated, he himself admitting of no improvement, and indeed maintaining that he was becoming weaker every day. One morning about this time he would not get out of bed, and paid no attention to the warder when expostulated with, but he took his breakfast as usual. When I saw him in the forenoon he refused to answer any question, nor would he put out his tongue when requested. His dreamy, staring eyes looked straight before him, and not even when I told him that if he did not put out his tongue, I must pull it out and have a look at it in spite of him, did he evince the slightest consciousness of what was said to him. His pulse was quiet, his skin cool, and I found that he had passed his urine in the morning. Although he was the last patient in the hospital whom I would have suspected of malingering, I felt convinced he was shamming in this instance, and accordingly applied the strong ammonia to his nostrils. He struggled a little, muttered something about his mother, and all of a sudden got hold of the sponge, saturated with the ammonia, between his teeth, and I believe, if I had not been prompt enough, would have swallowed it. He had then a dose of the electro-magnetic battery, to which he submitted without struggling. As he was in an open ward along with other patients, I was averse to pushing matters to extremes, and ordered a blister to the back of his neck, with a couple of drops of croton-oil to be taken internally. For two days there was no change in his symptoms or behaviour, but during the third night he got out of bed, went whistling through the ward, stopping now and again to stare into a patient's face, and ended by standing on the crown of his head on the top of the night-stool. Next day I ordered him to be restrained in a strait-jacket, and removed to a separate cell, and told him that the sooner he gave it up the better. He took the hint, and on the following day he appeared to be all right again—maintaining, however, that he did not know what was the matter with him. He was reported, and afterwards confessed that he had been "led into it" by other prisoners.

Now, this is a case which, at first sight, might have been mistaken for dementia of a subacute form; or, possibly, the widely-dilated pupils and the seemingly unconscious state might have suggested the existence of serous effusion into the ventricles or beneath the membranes of the brain. But against both of these views were opposed the facts that the bodily functions were performed naturally. He got out of bed to fetch his food, and ate it heartily; there was no retention of urine, nor did he pass either it or his fæces in bed.

Case 2 is worthy of note, chiefly on account of the persistency of the malingerer. I find from the hospital papers that prisoner W. H. was admitted into hospital for observation 8th Nov. 1869. His previous prison history was one of repeated punishment for refusing to work, breaking windows, destroying his clothes, filthy conduct, and the like. On admission he alleged that he would not work because the terms of his sentence precluded labour, and that he was the Duke of Orleans. He was put on low diet, and was ordered to have the back of his head shaved and blistered, which latter operation he resisted so vigorously that it was deemed necessary to restrain him in the strait-jacket. In a few days afterwards he promised to "give it up," upon which he was allowed a more liberal diet, and subsequently discharged. Bu e disliked work of any description, and was not long out of t punishment cells, again maintaining that he was "Egalité," and rying the monotony of his seclusion with occasional outbreak He first came under my notice when I joined this prison in Ap last year, and I fully concurred in the opinion which had hitherto en entertained of him, that he was a sulle bullet-headed fellow, and when he did speak, which was seldom, still feigned the old delusions, and invariably refused to go out to ork. This went on for some time, until one day he assaulted a officer, for which offence he was sentenced to be flogged by the Vis ng Director, and to be kept in separate confinement for six month During the whole of this period he scarcely ever exchanged a single word with any one. When his sentence expired he resumed the old practice of refusing to labour, and persisted in the old d usions. He repeatedly received bread-and-water punishment, and hough sent to do the lightest out-door labour, would do nothing. e was again put under medical observation; but on this occasion h dull intellect had coined a new "delusion." He maintained that "he had been dead and crucified; that he had been made a martyr or the cause of the glorious religion," etc. Any questions as to his sentence, crime, age, name, his former life, and the like, he refused to answer. He slept well, took his food well, and, in spite of th blister at the back of his neck, would have been content to remain in hospital long enough, although he significantly hinted that h was sure no amount of treatment would make him give up his belief. I detained him in hospital for two weeks, and allowed him libera diet, because after so much punishment he was somewhat below par. When discharged, he was reported to be sane and responsible for his actions; or, in other words, amenable to prison discipline. The sentence which was awarded him this time allotted him three days bread and water for every refusal to go to work during a period of fifteen days, provided, of course, as in all such cases, he were found to be medically fit. He was put to light labour, and refused to work on two consecutive occasions, after which he began to complain that he was very weak. I assured him that I would not in any way interfere, and, as kindly as I could, expostulated with him on the folly of his conduct. One day shortly afterwards he requested to speak with me, and promised to give up his scheming. Since that time he has behaved well, and been employed at ordinary out-door labour.

CASE 3 may be cited as a doubtful case. Prisoner J. L. was admitted into hospital for observation 29th April 1868. He had been repeatedly under punishment, but always for the same offence, viz., an unfounded complaint about the due weight of his bread. The medical record goes on to state:—"The loaf was weighed in his presence, and yet he was dissatisfied. He has been heard to say also that the doctor drugged his food so as to increase his appetite, and that the bread was purposely robbed of its proper proportions to torture him. He is not only a hard-working man, but in conversation he does not (with that exception about his bread) betray the slightest sign of mental aberration. It is a curious fact that, if his bread is stale, and therefore firm, he never disputes its proper weight; but if it is new, and therefore easily compressed between his fingers, he complains of light weight." He was retained in hospital till 5th August, during which period he repeatedly complained about the bread, and sometimes that his food was poisoned, stating that, though he could not detect any difference in the flavour, he knew it was poisoned from the effect on his stomach. When discharged he was recommended to the shoemakers' shop, because he had been a shoemaker by trade. On 21st Sept. of the same year he was again admitted into hospital for observation, having once more got himself into trouble, and created a disturbance about his bread. He remained in hospital till 1st Jan. 1869, the history of his case differing but little from what had previously been recorded; and, when discharged, I find the following entry:—"No sign of disordered intellect; says he has conquered his difficulty about light weight in his loaf." For more than a year afterwards he appears to have conducted himself tolerably well; but in May 1870, when he first came under my notice, he was a third time admitted into hospital for observation. The following is an extract from his hospital paper on this occasion:—"Patient maintains that frequently his food has been drugged, and in several ways. Although he cannot describe how this is done, he asserts that one way is so disgraceful that he could not mention it. When it is drugged he feels afterwards as if he could eat a bullock, and often becomes very ill-tempered without really knowing why. Complains also that his food is often of light weight. Is quite rational on all other points." He was kept under observation for two weeks, and, as there was no change in his symptoms, I certified him to be of unsound mind, and recommended his removal to Millbank Prison. As I have heard nothing of him since, the probability is that the same opinion of his case was entertained by the authorities there, and that he was ultimately removed to the Criminal Lunatic Asylum.

With regard to this case I frankly admit that there are certain points which might make it appear probable that the prisoner was an impostor. For example, although he often complained that his food was drugged, he never refused it, and, with the exception of his repeated outbreaks about this matter, his general conduct was satisfactory, nor was anything strange to be observed in his manner. It is true, he was at times moody, and was of a somewhat irritable temperament, but in this respect he did not differ from many prisoners who are considered to be amenable to prison discipline. There was no primary affection, such as acute mania or melancholia, nor did his delusion, if delusion it may be called, vary in its intensity or character during the separate period when he was under observation. Altogether it was a case concerning whose merits one could not decide with certainty, and under the circumstances I considered it to be my duty to give the prisoner the benefit of the doubt, though I must confess that such doubt was very shadowy in my own mind.

CASE 4.—On the 17th June this year, prisoner W. S. was found stripped to his shirt in his cell. He had been for some time in separate confinement on penal class diet for repeated breaches of discipline, but he had nearly finished his sentence. When spoken to, he kept his eyes shut, and, after crossing himself, commenced repeating the Lord's Prayer, the Creed, and portions of the Litany. For two days he refused food and drink, and on the third, I fed him roughly with the stomach-pump forenoon and evening. On each of these occasions I also gave him some strong whiffs of the liq. am. fort. During a period of five days he tasted no food of any description but what was pumped into him; and so dogged was his temper at this time, that I verily believe he would have died of self-starvation had he been left to himself. Whenever the liq. am. fort. was used, he promised to give up the feigning, but before the next visit he as invariably recommenced it. His head drooped on his chest, he allowed the saliva to trickle from his mouth, and would neither dress nor undress himself. Judging from his appearance, he might have been taken for a patient suffering from dementia, were it not that the tremulousness of the eyelids showed that he was always on the *qui vive*, endeavouring to peep out between them and see what was going on. After a time I admitted him into hospital, as he was in a somewhat emaciated condition, to try what kindness and a liberal diet would effect. Both were alike wasted on him, although he promised amendment whenever he had a chloroform or liq. am. fort. stupe applied to the nape of the neck, varied by an occasional dose from a galvanic battery. When he regained his normal weight, I discharged him, and he received a sentence of twenty-eight days' bread-and-water punishment in separate confinement. His feigning now assumed a new phase. He became extremely noisy and violent, would at times plaster himself over with his excrement, and would sometimes endeavour to assault any one who went near him. At last he was sentenced to be flogged. The punishment was administered a few days ago; and though he has not yet quite *given in*, there is every reason to believe that this treatment will result in a permanent cure.

This may fairly be regarded as one of those cases, so frequently to be met with in prison-life, which may be said to drift on that ill-defined border-land which separates sanity from insanity. For a time, the thin varnish which discipline supplies serves to conceal, and even to control, the turbulent nature within, but every now and again the veil is rent, and the prisoner becomes the veritable slave of frantic ungovernable passion, or of dogged determination to have his own perverse way in spite of expostulation or punishment.

The inherent—or rather, I should say, the inherited—mental incapacity of the habitual criminal makes him an easy prey to the worst impulses of the human heart. Possessed of little self-restraint or regulative power at any time, it is not to be wondered at that occurrences of the most trivial kind are quite potent enough to upset the unstable equilibrium of his mental and moral life. A cross word from a warder, a slight difference with a fellow-prisoner, or even a disordered state of the system, will often suffice to unhinge the passions and reveal the animal nature in all its naked repulsiveness.

Dr Maudsley, in his chapter on the Insanity of Early Life, writes: —"There is another class of boys who cause great trouble and anxiety to their parents and to all who have to do with them. Afflicted with a positive moral imbecility, they are inherently vicious; they are instinctive liars and thieves, stealing and deceiving with a cunning and a skill which could never be acquired; they display no trace of affection for their parents, or of feeling for others; the only care which they evince is to contrive the means of indulging their passions and vicious propensities. Intellectually, they are certainly defective also, for they usually read no better when they are sixteen years old than a healthy child of six years of age would do; and yet they are very acute in deception and in gratifying the desires of their vicious natures. Passionate, selfish, cruel, and sometimes violent, they are intolerable at home; and if they are sent to school, they are sure to be expelled. When they belong to the lower classes, they find their way to prison many times; indeed, they contribute their quota to the criminal population of the country; when they belong to the better classes, there is nothing for it but to seek out some firm and judicious person who, for suitable remuneration, will take care of them, keep them out of mischief, and, while checking their vicious propensities, will try to discover and foster any better tendencies which they may have in them. The resemblance of these beings in moral character to the lowest savages, and even to monkeys, is not without interest."

I have quoted this passage because I believe it to be a scientific and accurate description of the psychological state of the great majority of our habitual criminals. They form a distinct class by themselves, and are fitter objects for well-considered reformatory influences than for punishment. Not that I think that punishment, when judiciously administered, is not attended by good and wholesome results, but it ought not to be applied indiscriminately, nor without taking into consideration the condition of mind in consequence of which any violent outbreak or serious breach of discipline has taken place. Such prisoners are subject to a real "mania of acts," and it requires great care and tact on the part of all who have charge of them to treat them fairly and justly. Out of prison the law takes no cognisance of their inherited or acquired predatory disposition and insane temperament; they are regarded as agents wholly responsible, and punished accordingly. When they finish their sentences, they are again let loose on society, and, true to their nature, again return to their old habits. It is like discharging lunatics from an asylum before they are cured; but the public has not yet learned to look at the matter in this light, and so both the public and habitual transgressors against its social institutions have to suffer from a policy which is as thriftless as it is near-sighted and unjust. The habitual criminal, I maintain, ought not to be liberated until the authorities have assured themselves that he is so far reformed as to be safely trusted with his liberty. As it is, however, at the close of every fresh sentence he is allowed full scope to propagate crime in two ways,—by the direct transmission of his criminal taint to his children, should he beget any, and by the force of his example or the pernicious influence of his teaching on the young of both sexes who may come within his reach.

It may be thought that this is somewhat apart from the subject in hand; but in treating of feigned insanity, especially amongst prisoners, these pathological states of the criminal mind cannot be overlooked. While a comparatively large percentage of the habitual criminal class are acknowledged to be insane, imbecile, or epileptic, and are therefore not subjected to the ordinary restrictions of prison discipline, there is a far greater number who are liable to attacks of maniacal excitement, but who cannot on that account be excused from complying with the prison rules and regulations. Female prisoners of a depraved character are notably prone to these attacks, and generally at the menstrual period; indeed, with some who have come under my notice, an outbreak could be predicted whenever the period commenced. It would be alike without avail and cruel to punish severely all who offend under such circumstances as these; and as the question concerning the degree of responsibility of the delinquent depends on the medical officer, it is his duty to recommend mitigation of punishment whenever he thinks the merits of the case warrant it. At the same time, I am bound to admit that, with male prisoners, I have seen the best results follow a flogging when no amount of other punishment, expostulation, or kindness, could check a course of conduct that appeared outrageous enough for the devil-possessed; and, with incorrigible female prisoners, shaving the head has a wonderfully calmative effect.

Concerning the best means which can be adopted to make the malingerer who feigns insanity give it up, I need say little. Here, as in other feigned diseases, the galvanic battery is of great assistance, or a chloroform stupe applied to the nape of the neck. This latter remedy is speedy and safe in its action; and the intense stinging pain which it produces will, in a few minutes, make the schemer speak, if he is inclined to be taciturn, when harsher means fail. I need hardly say, that sharp measures such as these are never employed as means of diagnosis;—the nature of the case must be clear before they are had recourse to, and then they can be conscientiously administered as legitimate remedies.

It would have been an easy matter to have cited a larger number of cases; but I preferred to bring forward a few that presented more difficulties in the way of diagnosis than those usually to be met with in prison practice. I shall now endeavour to recapitulate briefly some of the more salient points in diagnosis, which, though they may not be of much value when taken singly, may nevertheless be of some service when taken collectively.

1. In feigned insanity, the attack comes on suddenly and without any warning. This is rarely the case in real insanity.
2. There is an absence of all purely physical symptoms.
3. If the feigned attack be violent, the malingerer soon exhausts his energies, and will fall into a sound sleep within twenty-four hours.
4. In the ravings of feigned insanity, there is a marked absence of any variety of ideas.
5. In all feigned cases, the malingerer will either refuse to answer simple questions, or will answer them in a wilfully absurd and incorrect manner.
6. He will seldom look any one in the face.
7. If delusions are feigned, he cannot conform his conduct and bearing to the character of the delusions.
8. As a rule, the feigned attack is over-acted.
9. There are no lucid intervals, the malingerer striving to appear insane on every point.
10. A feigned attack is so incongruous and incomplete, that it is next to impossible to classify it under any of the known varieties of insanity, whereas all feigned attempts bear a greater or less resemblance to each other.

There are several other points which are common to cases of acute mania, such as stripping naked, filthy conduct, and age (the prisoners who feign insanity being all young); but to these I do not attach much importance.

II. With regard to epilepsy, the difficulty experienced in detecting feigned cases does not consist so much in being able to discriminate between a false and a genuine attack when seen, but in being able to determine whether or not a patient, when brought forward after having had a "fit" which others have witnessed, has really been feigning. If the patient be seen immediately after the "fit," a good deal may be gathered as to its nature by his appearance and behaviour. Should there be no suffusion of the eyes, no puffiness and redness of the eyelids, no torpid and heavy appearance of the countenance, no confusion of thought, and no headache, the "fit" may pretty safely be put down as a feigned one, if the convulsions are described as having been violent or prolonged. It will also be found, as a general rule, that the patient has not injured himself in any way, provided the attack has been feigned in the presence of others.

For example, there are no signs of the tongue having been bitten, nor any bruises from a fall. But sometimes a prisoner, who says he is subject to fits, presents himself with very distinct marks on the face or head, and maintains that he received these while in a fit, and when he was locked up in his cell. I have met with several such cases, and it has always turned out that they were malingerers. With one exception, the marks have always consisted of abrasions on one or both temples, and sometimes on the nose, in which the cuticle has been removed by friction, either by a rough towel, or by rubbing the parts against the cell wall, or on the floor. Not long ago, however, I saw a prisoner who presented himself in this way, having a contused wound on the forehead, surrounded by a considerable amount of tumefaction, as if produced by a violent blow. He said he had fallen down in a fit; and though his appearance was by no means epileptic, and he had the reputation of being a malingerer, I could hardly help concluding that the "fit" must have been genuine. But the merits of the case were cleared up shortly afterwards. The prisoner happened to have a "fit" when I was near at hand, and I had sufficient grounds afforded me for altering my previous opinion. There is no doubt that he had intentionally knocked his head against the wall or floor.

In dealing with these cases, I have generally found it to be most expedient to speak frankly to the prisoner; assuring him, if there be no doubt in my own mind, that I believe his "fit" was feigned, and that I cannot change my opinion until I have an opportunity of judging for myself by seeing him in a "fit." He is also told that having a fit now and then need not interfere with his work, provided he is not working where he runs the risk of falling from a height. If employed at such work, he is recommended change of labour, suitable enough for an occasional epileptic, but none the less arduous. He will afterwards either take the hint, and give up this species of feigning, or he will afford an early opportunity of being seen in a "fit," when, as I have already said, detection is not difficult, and he gets reported and punished.

The symptoms of a common epileptic seizure are so well-marked and unique, that we can scarcely conceive it possible that they could be well feigned, even by a person sufficiently cognisant of them. The sudden fall; the frequent scream or groan when the attack sets in; the total loss of consciousness; the violent convulsions; the rapid jerks, as if caused by a galvanic battery; the contortions of the facial muscles; the short and hurried breathing; the grinding of the teeth and foaming at the mouth; the spasmodic turned-up action of the eyes; the insensible iris; the pallid, afterwards bloated, congested countenance; the clenched hands; the bitten, bleeding tongue—are, in the majority of cases, more or less so well-pronounced, that their genuineness cannot be mistaken. In the feigned attack, on the other hand, the mind of the impostor can only direct its energies to the display of two or three manifestations simultaneously, and even these give the impression of studied effort; whereas, in a real seizure, the absence of all control is not only prominent, but every symptom seems to be under the influence of a power beyond human effort. Fortunately, however, a differential diagnosis between a real and feigned epileptic seizure need not be confined to symptoms; for, if the case looks suspicious, the application of a sponge saturated with strong ammonia to the nostrils will speedily make clear its character. Sometimes dashing cold water on the patient will make him wince, though in the majority of cases it does not readily bring him to his senses; but if the hand or a towel is pressed over the lips so as to prevent breathing through the mouth, the schemer will at once commence to struggle, and, according to my experience, gives in almost immediately, if the sponge be kept applied.

III. Headache and vertigo are frequently feigned by prisoners, in order to escape work for the day, or to gain admission into hospital. In arriving at a decision in such cases, a great deal may be gathered from the character of the patient, especially if there be no significant physical sign to lay hold of. If the tongue be clean, the pulse quiet, and the countenance devoid of any expression of pain or discomfort, there need be little doubt that the case is feigned, or, at any rate, that the complaint is exaggerated; and an emetic, judiciously administered, will, in all likelihood, produce a permanent cure. Children, it is well known, are very apt to feign headache on the slightest pretexts; but to them a dose of salts and senna, or of Gregory's powder, is sufficiently distasteful to prevent them from frequently repeating this form of scheming.

I have never seen an instance of feigned hemiplegia, nor can I conceive, though several such instances have been recorded, how any painstaking medical man could be duped by a case of this description. It might be easy to drag one leg, and to allow the arm to hang listless and slightly adducted by the side, but no amount of effort could at the same time produce the flabby and relaxed state of one side of the face, the drawing of the mouth to the other, the inequality of the size of the nostrils on deep inspiration, the characteristic curve of the protruded tongue, and the peculiar twist of the mouth on attempting to blow or whistle. A careful examination would also detect, in the real disease, a slight difference in temperature between the healthy and affected sides, as well as a difference in the firmness of the muscles and general condition of the limbs.

Severe neuralgic affections, whether proceeding from derangement of the cerebral or spinal system, are always attended by an expression of countenance indicative of pain, which cannot easily be feigned; and particular diseases, such as sciatica and tic douloureux, are so clearly defined, that patients suffering from them can describe the symptoms with sufficient precision as to admit of no doubt concerning their genuineness. Pain itself cannot be regarded as an isolated symptom if it be of any severity. The patient ought to be able to localize it, and to describe its character; if he can do neither, he suffers from what is called the "all-overs," and may safely be put down as a *humbug*. I need not say that in all such cases, inquiries are made with regard to appetite, loss of sleep, the state of the tongue, pulse, etc. No concomitant symptoms should be overlooked, and no adverse opinion given unless it is well considered and admits of no question.

IV. Feigned diseases of the organs of sense are confined to affections of the eye and ear. Now that the ophthalmoscope has been introduced into practice, and the study of eye diseases has become so general, such conditions of the organ of vision as myopia and amaurosis cannot well be feigned successfully. A person pretending to be short-sighted will not readily pass an examination with different sets of glasses (plain, convex, and concave) without being detected; while with the aid of the ophthalmoscope, one ought to be able to make out the pathological changes which take place in the really amaurotic eye. In suspected cases of amaurosis, a ready test can also be resorted to by confining the patient in a dark room for a time, and afterwards exposing him to a bright light, such as that of the burning magnesian wire. If he can bear such a light without wincing, and if the iris remains sluggish, and the pupil dilated, there is no doubt that vision is affected.

In my own experience, however, I have found that tampering with the eyes, so as to induce conjunctivitis, or ulceration of the cornea, is of far more frequent occurrence than feigned myopia or defective vision. Any irritating substance, such as a small particle of lime, white-wash, etc., if introduced beneath the eyelids will, in a short time, produce a highly congested state of the whole conjunctival membrane, and ultimately ulceration of the cornea, if the irritation be kept up. As a rule, both eyes are tampered with, and present an intensely inflamed appearance when first seen, the inflammation being pretty equally diffused over the whole membrane. The patient generally states that the inflammation set in during the night, and attributes it to cold. Treatment, if limited to the usual remedies, does him no good; so that the conjunctivitis, which commenced without any apparent cause, may continue to exist for weeks. In such cases as these, and indeed in all cases of conjunctivitis setting in suddenly and unaccountably, it is advisable to examine minutely with a magnifying lens the surfaces of the eye and of the everted eyelids, when very frequently some foreign substance may be discovered. If removal of the substance be not followed by relief, there need be no doubt that the irritation is kept up in some way, such as by rubbing the eyes, by bathing them with urine, by inserting soap, etc. But the disease may be factitious without our being able to discover the means employed, and hence, in all suspicious cases, the speediest and most effectual treatment is to prevent any further tampering. After having the inflamed eyes carefully douched with cold water, this can be effected either by applying a pad of cotton-wool, and retaining it with strapping and bandage; or, if this be interfered with, by having the patient put in the strait-jacket and tied down in bed.

Little need be said with regard to feigned or factitious diseases of the ear, though both in the army and amongst prisoners cases are not at all uncommon. Feigned deafness comes on suddenly, whereas the real affection takes place very gradually, and is, or has been, accompanied by some tangible symptom of disease. A person not wholly deaf has a gaping and observant cast of countenance, the mouth being kept open to aid the hearing, and the eyes keenly watching the movements of the lips of any one addressing him. He generally talks in a loud, harsh, unmodulated tone of voice. The impostor, on the other hand, has a furtive expression, does not elevate his voice when speaking, and generally overacts his part. In coming to a decision with regard to such cases, it is necessary to inquire minutely into the history of the complaint, and to make a careful examination of the ear itself. A little *finesse* in conducting the conversation, or in taking the patient by surprise, will generally succeed in detecting imposture.

Otorrhœa is sometimes simulated, and sometimes induced. It has been feigned by introducing honey, soap, etc., and excited by the introduction of acrid substances. A free use of the speculum and ear-syringe will suffice to make clear the character of such cases.

(*To be continued.*)

Article III.—*Observations on the Therapeutic Value of Chloral.*

By Alexander Edward M'Rae, C.M., M.B., Fettercairn.

(*Read before the Forfarshire Medical Association, July* 1871.)

The late Sir J. Y. Simpson is said to have prophesied, years ago, that amongst the new organic compounds almost daily discovered, some narcotic would be found "as important as that most useful of all drugs, opium, and yet without either its direct constipating effects, or its indirect tendency to produce subsequent nausea." It seems, however, that prior to the utterance of this prophecy, Baron Liebig had actually discovered, in 1832, the substance now known as chloral, though for wellnigh forty years it remained, as did prussic acid, a chemical curiosity. Chloral is a chlorate of carbon, and is composed of three atoms of chlorine united to two of carbon, is liquid, but on the addition of an equal quantity of water solidifies into a white amorphous mass, and is known as the hydrate of chloral.

In this state its therapeutic value was made known by Dr Liebreich of Berlin, about two years ago, and since then who has not used chloral? As the hydrate alone, it is sold in commerce, and many makers now vaunt their own productions as the most valuable; and since its introduction into Britain upwards of eighty tons have been used. The specimen that contains the greatest amount of chloroform is said to be of the greatest therapeutic value; 72 per cent. is about the highest. That which contains least chloroform and most alcohol is said to be of least value. The least reliable kinds contain only about 50 per cent. of chloroform.

Many and various have been the remarks made and printed regarding its value as a therapeutic agent; the prophetic voice has been raised in no measured terms to sound its future glories, and I may safely say that there are few practitioners in Britain who have not tried it, and been more or less delighted and thankful with its results. Hundreds of cases have now been recorded. In many, marvellous results have been obtained; in others, either from the insufficiency of the doses, or not continuing its use long enough, or the inappropriateness of the case, no benefit has been derived; and in some, no doubt disastrous results have occurred; but the value of the drug is not to be estimated by its failures. Much is now known of its effects, and when the *rationale* of its action is determined, and the how and the when it is to be administered are better known, undoubtedly chloral will become a safe, valuable, and highly-prized medicine.

Without digressing to give you the history of the various steps in this important discovery, I shall lay before you a brief summary of the chief facts observed by myself and others, and from these facts I trust we will be able in some measure to form an estimate of its value as a pure hypnotic of the first degree.

There are three modes of administering chloral: by suppositories, per rectum; injection, hypodermically; and in draught.

Whidborne has found suppositories composed of one to two drachms chloral, made with hard soap and honey, very useful when the stomach rejects the draught. When given hypodermically, its action is similar as when taken in a draught; but it is said that when thus used it has created abscess, gangrene, and pyæmia; I myself have seen severe inflammation of the cuticle and subcuticular abscess in rabbits. Nevertheless, so good an authority as Richardson has not observed this condition. It is, however, almost always given as a draught, the vehicle varying according to the caprice of the prescriber or the wish of the patient. When taken as a draught, in a dose varying in different individuals, and in the same individuals at different times, it sooner or later acts as a hypnotic, producing a pleasant and refreshing sleep, without loss of consciousness. When given in small doses, neither consciousness nor reflex action are destroyed; if given in 90-grain doses or upwards, anæsthesia more or less profound is produced.

Many have recommended it to be given in syrups, or medicated waters. These often increase the pungency, and produce nausea. I believe the best vehicle is plain spring water, not less than an ounce to each 30 grains. The more freely the drug is diluted the better.

In regard to the dose, there is more difficulty, and it varies according to the strength, disease, habits, age, amount of exhaustion present, size of the patient, and the quantity of food in the stomach. Teetotallers are said to require smaller doses than free-livers. Strong, robust people, accustomed to good diet and plenty of exercise, require much larger doses than people that are naturally of weak constitution, or made so by sickness. The more intense the pain, the dose will require to be correspondingly large. It has been said that when given daily to the same patient the dose has to be increased. I cannot say that I have found this to be the rule. It may be the fact in some cases for the first few days, until the exact dose required to produce sleep is gained, but when its exhibition is extended over weeks or months, I have not found that the dose has to be increased. In some cases I have found the reverse: where 40 to 50 grains were required some nights, I have found 20 and even 15 grains produce sleep, from six to ten hours, on other nights in the same patient. I consider 30 grains a fair dose to give to an adult patient, and if no effect is produced in two hours, I should give other 15 grains. Dr Will of Aberdeen has given 4 grains to a child eight months old. Usually 15 to 60 grains will produce sleep in ten to fifteen minutes; 30 to 77 grains permits the painless extraction of teeth. Richardson considers 120 grains a dangerous dose, and 180 grains a fatal dose. Dorigo gave a boy 90 grains a day for fifty-four days, and cured tetanus. Grandisso-Sylvester gave a girl, eight years old, half an ounce in five days, and cured tetanus. Bensasson of Tunis gave a boy of thirteen 5 ounces in thirty-five days, and cured tetanus; and Dr Fuller records a case where 30 grains proved fatal to a young lady, and another case where 30 grains produced very alarming symptoms on two different occasions. Although millions of doses have now been given, representing an amount of freedom from suffering, and peaceful hours of slumber, far surpassing that given by any drug or all narcotics put together, in the same number of years as chloral has been in use for months, very, very few indeed have been the cases where absolute harm has resulted; and in these cases it is impossible to say how far the ignorance of the administrator was to blame.

Chloral is said to undergo a chemical transformation in the blood, and its introducer, Liebreich, says that it is changed into chloroform by the alkalinity of the blood during its passage in the circulation. Personne of Paris also supports this view, and Mr Ralph of Victoria, who has been experimenting largely on the animal economy with the microscope, agrees. He says that chloral in its passage through the circulation is decomposed by the alkaline salts of the blood into chloroform, and either formyl or a formiate of some alkali; and he believes that the action of the chloroform is considerably altered by the formiate. He found that when administered by the stomach or subcutaneously injected, it gives rise to bright or dark-red particles, masses, or globules in the blood. Starch bodies are likewise met with accompanying these changes. The urine also exhibits these bodies. Formic acid added to fresh blood also causes the production of dark-red globules or particles. Other experiments showed that similar effects were produced by lactic and prussic acids conjoined. In strong proof of this opinion, some have remarked the odour of chloroform as distinct from that of chloral in the exhalations from the skin, and some intolerant of chloroform are also intolerant of chloral. Demarquay, however, takes exception to this view, and believes that chloral is not transformed into chloroform in the blood. If it were, he says we should have the same effects produced as we have with chloroform, and he assures us he has remarked the odour of chloral in the breath. This my friend, Dr Will, also confirms. Demarquay holds, therefore, that chloral is eliminated through the respiratory organs, and is not decomposed in the blood. He also remarks that the symptoms look similar to those produced by section of the sympathetic nerve, so well described by Claude Bernard. I see no reason why chloral should be decomposed by the alkalinity of the blood more than alcohol, which is an allied inorganic carbonaceous compound, and is found unchanged in the ventricles of the brain of those who have died from excessive indulgence. I do not know whether Demarquay may mean the effects produced by the inhalation of chloroform, or those produced by imbibition. I believe the effects produced by chloral, and those produced by a moderate dose of chloroform when taken internally, are the same, viz., muscular relaxation, determination of blood to the surface, relief of pain, and sleep without unconsciousness. If I understand Demarquay to mean the effects produced by inhalation, then I agree with him that the effects are not similar. If he means the effects produced by imbibition, I must demur to his conclusions, for I believe, as I have said above, that they are similar. In that case I should vote for Liebreich's view. Demarquay's arguments in favour of his own view are too hypothetical, and will not stand before the more powerful arguments of chemical research, as shown by Liebreich and Personne. I must refer you, however, to the periodicals of the time for these experiments.

Although all are not agreed as to its chemical transformation in the blood, all join issue and believe that chloral, transformed or untransformed, acts directly on the cerebro-spinal centres, only one man declaring his disbelief, and asserting that it acts directly on the cerebrum alone. Brunton says that " chloral acts on the brain, producing deep sleep, during which there is no sensation, no voluntary motion. The reflex function of the spinal cord is first increased and then diminished in frogs. In guinea-pigs and rabbits it is diminished for thermal irritants, but not for tactile ones—pinching producing reflex action, but burning or pricking none. It leaves the motor nerves, vagus, and muscles unimpaired, but diminishes the activity of the respiratory nerve-centres, rendering the breathing slow, and of the cardiac ganglia somewhat weakening the heart. It lessens the blood-pressure and tension, probably by dilating the vessels at the surface, as the ears of a rabbit become hot and its vessels dilated, while the general temperature is falling." Demarquay, in No. 40 of *Gaz. Hebdom.*, gives, as the results of his experience, the following:—" (1.) It has a well-marked hypnotic action, particularly on feeble and debilitated individuals. (2.) The duration of its action is in direct proportion to this feebleness. (3.) The slumber which it produces is generally calm, and free from agitation, except in those patients who are the victims of acute suffering. This fact," he says, " induces me to recommend chloral in diseases in which one desires particularly to bring about sleep and muscular resolution. (4.) This agent may be given in a sufficiently elevated dose, and no bad symptom is produced by the administration of from 15 to 80 grs." In the same paper he remarks that, " if the sensibility of the animals is examined during the experiments, it is found that they possess an exaltation of this faculty." " Under the influence of chloral the pulse becomes extremely small, and at the end it can no longer be reckoned. The animal temperature, under the influence of this agent administered in strong doses, lowers from half a degree to a whole degree." Dr Crichton Brown has recorded several cases, and Dr Husband one case, where considerable flushing of the face took place and urticaria was developed, thus showing a determination to the skin. In one case I have seen the flushing followed by pallor, and in the same person a determination to urticaria prevented by daily aperients. In the 42d No. of the *Gaz. Hebdom.*, Dreulafoy and Krishaler conclude, from their experiments on rabbits, that we may produce at will, with hydrate of chloral, exaggerated sensibility and complete insensibility. They experimented by subcutaneous injection, and found the results more reliable than when given by the stomach, the latter depending on the quantity of food the stomach contained. The following are their conclusions :—" (1.) Chloral in small doses excites sensibility—in elevated doses it reduces it gradually to complete anæsthesia. (2.) The narcotized animals pass through an anterior state of excitability. (3.) General and absolute anæsthesia may remain for several hours; they then almost always invariably succumb. (4.) Sleep exists with hyperæsthesia as with anæsthesia—in the latter case the resolution is absolute. (5.) Chloral modifies profoundly the number and rhythm of the movements of the heart; it causes progressive slackening of the movements of the diaphragm, and lowers considerably the temperature. (6.) The phenomena excited by chloral are, in many points, different from those caused by chloroform, although the anæsthesia is equal in the two cases. (7.) Rabbits treated by doses exceeding 2·5 grammes—equal to 31 grains—are always rendered anæsthetic; by doses above 3·5 grammes, or 46 grains nearly, they are rendered anæsthetic and killed; by doses below 15 grains they were put to sleep, but neither rendered anæsthetic nor killed; by doses below 60 centigrammes no effect was obtained." With these conclusions, any one wishing to use chloral may accept them as his creed, and proceed on his noble mission to suffering humanity, and soothe the fevered in the Lethean stream.

It will be seen, therefore, that opinions differ somewhat regarding its anæsthetic properties, and some again do not even mention the increased excitability. Undoubtedly, however, it possesses these properties, and they are related to each other in time. The only reason I can give for this seeming discrepancy is, that experimenters have not, like Dreulafoy and Krischaler, drawn their conclusions from a sufficient number of experiments made upon material of equal conditions and variety of doses. Another reason is, that many have drawn their conclusions from observations of its effects on the morbid human economy—a source fraught with many quicksands to reliable conclusions. To explain my ideas of the different phenomena produced by the exhibition of chloral in a healthy animal, I shall divide them into seven arbitrary degrees, each degree possessing quite distinct symptoms depending on a certain undetermined dose. 1°, If a small dose is given, no appreciable effect is produced; 2°, If a larger dose, hyperæsthesia is produced; 3°, If still larger, hyperæsthesia and sleep; 4°, If still larger, hyperæsthesia, sleep, partial unconsciousness, and muscular resolution more or less; 5°, If still larger, hyperæsthesia passing into anæsthesia, sleep, unconsciousness, complete muscular resolution, cessation of pain; 6°, If still a larger dose, these states become more profound, and hyperæsthesia passes into anæsthesia, pallor is exhibited, and vital temperature falls; 7°, If the dose is very large, then complete anæsthesia, coma, and death. These, I believe, are the true sequence of events in the phenomena evolved in the animal economy by the administration of chloral. The ludicrous stories that are told of medical men being sent for in the middle of the night to go with all speed to see patients whom they had fondly hoped were reposing peacefully in the arms of Morpheus, but who had received a dose of the sixth degree, and alarmed their friends by their stertorous breathing and complete anæsthesia, rushing into the bedroom in despair, and finding two or three hours' hard work and careful watching as a punishment for their disbelief in its anæsthetic powers. These incidents, though sometimes producing a little laughter at the expense of the doctor, tell their own tale seriously enough, as in the case of the young lady recorded by Dr Fuller, and that of the clergyman recorded by Dr Hunt.

Another property of chloral is its power of resolving muscular spasm or rigidity. All observers are agreed on this point, so far as

I have seen. As such, it is a valuable and powerful drug, and does not possess the same objections that other drugs belonging to this class do. Its use with this view is very extensive.

Some assert that it is only a simple stimulant, and in many respects its action is analogous to that of alcohol. Undoubtedly their action has many points in common. For instance, alcohol given in small quantities excites, and produces hyperæsthesia, and a determination of blood to the superficial vessels, and increases the heart's action; when given in large doses, it lowers the temperature, modifies the heart's action, produces profound muscular relaxation and complete anæsthesia. What else is the meaning of the vulgar phrase "dead drunk?" Yet choral can do more than this, for if given in proper doses, it induces sleep within a few minutes, and acts as a calmative, and leaves no bad effects behind. This cannot be said of alcohol. Again, it relieves excessive irritability—the usual source of reflex action; but it is as a hypnotic that its chief virtues are prized so highly. Dr Clarke says, "While it does not produce headache, derange the digestive organs, nor cause loss of appetite or nervous prostration, it leaves the effects of a sound and placid sleep, and a night's repose is always fraught with great advantage, particularly to those labouring under a malignant disease; and where a hypnotic is indicated, we possess in choral an efficient and safe one;" and I assert that it is more certain than bromide of potassium, and is without the disagreeable sequelæ of opium. In procuring sleep, therefore, and resolving muscular contractions, we have a drug that has proved itself more useful than any other, and without the serious objections of others. Considering that it is a relaxer of muscular contractions, it must be useful in that large class of cases comprehended under the generic term *Neuroses;* and indeed the many records of cases that now exist amply prove its great usefulness in that class of diseases. Indeed, for tetanus, sleeplessness, and delirium tremens, it may be said to be a specific. "It has charms to soothe the savage breast," and gives

"Sleep, that knits up the ravelled sleeve of care,
The death of each day's life, sore labour's bath,
Balm of hurt minds, great nature's second course,
Chief nourisher in life's feast." SHAKESPEARE.

As an anodyne, it also possesses great powers when given in small frequently-repeated doses, and as such might be called the "friend of woe," as opium used to be called the "sheet anchor."

To sum up, then, seeing that chloral is an anodyne, a calmative, a relaxer of muscular contraction, a reducer of vital temperature, a tranquillizer of the heart, a reliever of vascular tension, a producer of superficial hyperæmia, a sleep producer, a hyperæsthetic, an anæsthetic, etc., we should expect it to be useful in allaying the pain of abscess, malignant tumours, in rheumatism, and in gout, in colic and mental excitability, in spasm of the voluntary and involuntary muscles and sphincters, in contracted pupil caused by reflex action, in strangulated hernia, in the passage of calculi, in luxation of joints, in rigidity of the os and perineum, in spasmodic croup and hiccough, in asthma depending on reflex action, and in constipation caused by irritability of the bowel, in pyrexia, and in functional irritability of the heart, in throbbing of vessels and coldness of the surface, in engorgement of the viscera, in white softening of the brain, and in those states of the cornea depending on malnutrition from weak circulation, in skin diseases from the same cause, in sleeplessness from whatever cause, whether pain, delirium, mania, or old age, in sluggish circulation, in operations more or less severe, in diminished irritability, and, strange to say, in increased irritability from whatever cause. These latter may appear a paradox, but we must bear in mind that chloral in large doses has very different effects from what it has in small doses. Neither must we forget that many of these diseases may have remedies more suitable to their peculiarities than chloral, and that there may be other conditions present that may contraindicate its use, such as pleurodynia with hæmoptysis, spasm of the bowel with dysentery, spasm of the uterus with retained placenta, in which cases I should fear fatal hæmorrhage. Although I am aware that so great an authority as Sir J. Y. Simpson gave it in a case of bronchitis with hæmoptysis, and expressed no fear, I am inclined to think that Sir James "rushed in where angels fear to tread." In a case of hysteria, where I gave chloral for months, hæmatemesis became so frequent and so violent that twice the patient's life was despaired of, and I had to abandon its use altogether. Another case is recorded by Dr Husband, where fatal hæmorrhage occurred in a case of fibrous tumour of the uterus. These may be explained, when we remember that chloral is a decreaser of arterial tension when given in doses of the fourth degree.

Regarding its great use in cancer, let me quote from Mr Weeden Cooke: "With the greatest faith and ardent hope, I have worked conium by itself, in combination with hyoscyamus, with belladonna, and conjointly with bark, thoroughly; and I still use it advantageously in some cases, but I regret to say it does not supply the need. It does not give relief from pain without disturbing the digestive process, neither does belladonna, nor hyoscyamus, given alone or in combination; . . . . and morning sickness and loss of appetite are the penalties paid for a night's rest procured by morphia or opium frequently administered. Turning, then, to hydrate of chloral, there arises a hope that we have in view a method of relieving pain, and securing sleep, which shall not interfere with the assimilation of food, and which may be employed without producing any sort of unconsciousness. . . . . The results obtained in the cases in which I have employed it are so charming, so persistent, that, fortified by the experience of others, I feel bound to add mine in confirmation of the excellent result obtained from this drug." Dr Maxwell Adams, of Lanark, says that "chloral will almost instantly induce sleep where the brain is functionally or organically disturbed." I cannot, however, say that I have found this invariably to be the case. A patient, a convalescent from acute mania, goes to sleep in twenty minutes with a 15-grain dose; occasionally, however, she requires 45 grains within four hours. Those days that she has least exercise she needs almost no chloral, and when she has had a deal of exercise, especially in the evening, she requires a large dose. To obviate the tendency to anæsthesia, I find that when a large dose of bromide of potassium is combined with a small dose of chloral, say 20 and 15 grains of each, a refreshing and placid sleep is produced, without the stertorous breathing, but the stupid appearance of the patient is increased next day, and she is mentally duller. Another fact is, that when 40 or 60 grains of chloral will not produce sleep, 15 or 20 will when combined with 20 or 30 of the bromide. It is now a well-ascertained fact, that when combined with other narcotics, a much smaller dose of chloral will produce sleep. In rheumatism and gout, its anodyne and hypnotic effects are of immense value. In colic I have found it of very varying use, being very frequently rejected. Where there is valvular disease of the heart, I have always found that it was rejected immediately. This may be a safeguard, for knowing that chloral decreases the activity of the ganglia of the heart, it should not be given where there is any mechanical obstruction to the free flow of the blood. I observe that Drs Fuller, Crichton Browne, and Dunlop of Jersey, agree with me on this point. Oddly enough, their patients kept the draught and the unwished-for symptoms were developed, while my patients invariably rejected the draught in a few minutes. I have no experience of its use in reducing the temperature in fevers, but Dr Russel, of Glasgow, gives a very scientific and elaborate account of his doings with chloral. I have found it useful in relieving cramp, in checking nocturnal micturition in children. Its action in these cases is marvellous, and I have no doubt it would be equally so in spermatorrhœa. In patients troubled with frequent micturition, not caused by stone, it is decidedly useful, and under repeated small doses they are able to retain their water a very much longer period. In tenesmus it proves of great value; and several cases are recorded of its successful exhibition in cases where excruciating pain was caused by the passage of calculi, both renal and hepatic. A few weeks ago I was called to a man who exhibited all the symptoms of renal calculus of the left kidney. The pain was excruciating, and the patient was in a state of collapse, with a weak, soft, and scarcely perceptible pulse of 35. I administered a dose of 30 grains of chloral, and left. Next day I found that he had fallen asleep in ten minutes—had slept for eight hours, had occasionally then for two or three hours experienced a sharp, cutting, tearing pain, low down, in front of the abdomen. Next week I was gratified by the man coming and showing me two small calculi he had passed.

In young children I should prefer it to chloroform in reducing dislocations, but since chloral came into use I have not had a chance.

It promises to be of immense value in parturition, especially in rigidity of the os and perineum, and where the uterine action is of a spasmodic kind. A good fair dose would act as a shock, and set things to rights. I have used it in several cases of perfectly natural labour, and the mothers expressed their gratitude. During the interval of pains, they went fast asleep. The sleep was sound, placid, and free, and not so disagreeable and troublesome as that produced by chloroform, and infinitely more useful to the country practitioner, who cannot always have an assistant by his side. When the pains came on they were more vigorous and direct. The parts seemed to give way with greater freedom than usual, and the mother was only half roused. When the case was over, they declared that they had not been to sleep at all, but knew everything that was going on. This may have been the case, as they only got 15-grain doses every forty minutes or so, but they lay perfectly still and seemed to enjoy it. I have now had more than a year's experience of it in this way, and feel quite at home in using it—much more so than ever I did with chloroform. There is no more hæmorrhage than usual, if so much.

In functional diseases of the heart, depending on improper action of the nerves or dyspepsia, I should think from its physiological action it would prove useful, but I have had no case to try it with. In spasmodic asthma it gives great relief, and, if a sufficiently large dose is given, it will check the spasm in a very short time. One would think it would be contraindicated in constipation, but if the constipation depends on muscular spasm from irritation, then chloral has a very beneficial effect, and favours regularity of the bowels. In engorgement of the viscera, it might be of benefit by producing a determination to the surface, but I think we have more powerful and trustworthy remedies for these ailments. In pneumonia, and nephritis with the symptoms of uræmia, I fear its use would be followed by very unwished-for results, but I have no experience of it in such cases.

In white softening of the brain, in ulcerated cornea, and some skin diseases depending on malnutrition, its action would be somewhat catalytic, and would produce no favourable result unless the appropriate kinds of food were given. The chloral would help them to be determined to the diseased parts, by being given in small and frequently-repeated doses.

In delirium tremens it would seem almost to be a specific, and in chloral the long-dreaded tetanus seems to have met its match; and if they have not hitherto fought fair, it is, to use a pugilistic phrase, only because the seconds have not been aware of "the rules of the ring."

In acute mania it has proved a great boon, and can be used when most other narcotics are contraindicated. In two cases I have used it, and the patients and their attendants have enjoyed a rest varying from four to ten hours.

Things new are often objected to, sometimes from no reason whatever, and parties often lay their dictum against an innovation because in their own secret souls they feel disappointed they were not the first to bring the stranger—to use a ball-room simile—"on the boards;" and chloral, having been well introduced, and having at once taken a position, many were the heads that with jealous eye saw the illustrious stranger in full swing with the fairest of the dames. Many were the objections raised—some real, some fancied. Before, however, I mention the objections, let me state the appearances produced by an overdose, and those seen *post mortem.* When the dose has been too large, complete anæsthesia—that is, insensibility to all external objects—is sooner or later produced, pallor of the face, upturning of the eyes, loss of pulse, coldness and rigidity of the extremities, with slow and stertorous breathing, symptoms similar to those seen in chloroform narcosis and alcoholic toxæmia. The principal and only appearance attributable to chloral seen after death are redness and congestion of the cerebral membranes and mucous membrane of the stomach. Let me also indicate, that from its known action it should not be given in organic heart-diseases, in hæmoptysis, in hæmatemesis, in hæmorrhagia, or in any uterine disease where hæmorrhage is a constant symptom, in severe inflammatory affections of the bowels, kidneys, liver, stomach, or lungs. The general statement, that where hæmorrhage is a constant symptom chloral is contraindicated, must be received with some qualification. If hæmorrhage be the result of depresssd nerve force, and not organic disease, then small and frequently-repeated doses will have a beneficial effect in arresting the hæmorrhage. In making these exceptions, we at once get clear of a great many of the objections. The remainder are easily answered. One good objection is said to be its uncertainty of action. I am confident that when the exact dose for each individual case is attained, this objection will vanish, especially when we bear in mind that when conjoined with other narcotics its action is more certain. It is said sometimes to cause fearful dreams. Increase the dose, and set the whole of the faculties to sleep, and the sleep will be quiet and placid. Another objection is, that when given to maniacal persons, though sleep is produced, they waken up in the morning as maniacal as ever. Well, this is a serious objection, one would think; but when we remember that chloral does not cure organic lesions, its result in such cases is not to be wondered at. In virtue of its power of coordinating nerve force, we must only expect it to be of radical use where functional disorders obtain. But, although it does not cure organic lesions, or eradicate malformations—what drug does, *per se?* —it gives the patient a sound night's sleep, during which period the mental and physical powers regain lost energy and substance, the attendants get their rest, and no bad effects, with rare and easily-determined exceptions, are produced. If it is too pungent, and is rejected, more freely dilute it. It is said to produce flushing of the face and urticaria. If the bowels are well regulated with a daily aperient this will soon disappear. If it does not produce sleep, or has no power on spasmodic ailments, then increase the dose. If a large dose does not produce sleep in a free liver, give a purge, and combine it with another narcotic. It is said to produce inflammation of the stomach, evidenced by gastric pain and faintness; then dilute freely, and give it on a full stomach. In relaxed condition it is said to favour hæmorrhage; then don't give it. Pregnant women have complained to me that after the dose the movements of the fœtus became very violent and unbearable. I have learned in those cases, where necessary, to give other narcotics. One very serious objection to the use of chloral, however—and it is the last I shall mention—is, that in enfeebled subjects it is apt to produce too prolonged a sleep, when the natural feeding times are passed over. This, coupled with its known action on the cardiac ganglia, may lead to fatal exhaustion, and when we add to this its power of decomposing the blood, as observed by Liebreich, Personne, Demarquay, Ralph, and Richardson, we may have an explanation of those few fatal results—happily but few—that have been recorded. I may remark, however, that if the anæsthesia is not great, the patients can be raised up, fed, and again laid down.

Much might be said of its dangers. These I have already incidentally indicated; but I may further mention, that as chloral is a cumulative medicine, its danger increases in the ratio of the increase and frequency of the dose, and leads to paralysis of the voluntary and involuntary muscles, as proved by the shakiness of the legs, and increased power of retaining the urine after a too large dose. Further, it does not follow that the more one takes the more he is able to take. There is no such tolerance produced with chloral. I believe the more one takes the less is the system able to withstand its toxæmic effects, and that by reason of its cumulative tendency.

In all my reading I have seen no case of suicide from chloral, and as it is likely to be rejected when taken hurriedly in a dose sufficient for the purpose, I should think that it is not a likely drug for such unphilosophic people. If it were not rejected, however, strychnia is said to be its antidote. This fact Liebreich discovered while observing its effects in cases of trismus. Unfortunately, the opposite does not hold good; for the direct therapeutical action of strychnia being much more rapid than that of chloral, when given in poisonous doses, it kills before chloral can take effect, and, being an inorganic compound, is not likely to be detected in the tissues long after death.

Much more could be said in fewer words of this remarkable drug, but, as the common saying has it, the less one knows about a thing, the more they say about it. Such may be the case with me, yet I have been induced to say this much, because, if I said anything, I felt I could not say less. I made an abstract of all the cases recorded, but found it too extensive for our present meeting. My object is to draw from the members of this Association their experience of its use, and if, in the altered couplet of Pope—

> " While anxious doctors painful vigils keep,
> Sleepless themselves, to give to others sleep "—

I succeed in inducing any to use chloral, and for suffering humanity invoke " the friend of woe," my object will have been accomplished.

ARTICLE IV.—*Notes from Practice, New and Old.* By JOHN BALFOUR, L.R.C.S. Edin., I.G.

IN a former number of this Journal (June 1869) I gave a few cases illustrative of the value of sulphurous acid lotion in the treatment of contused wounds: extended experience has increased my faith in the application. It gives almost instant relief from pain, controls and greatly restrains suppurative action, and, when possible, secures primary union, perhaps as efficiently as carbolic acid. The lotion is of the strength of one in twelve, a thin rag (the thinner the better) is laid over the wound, and kept constantly wet for the first thirty-six to forty-eight hours. When cold becomes less agreeable, the lotion is used tepid, the rag wet every twelve hours, and covered with gutta-percha. When primary union is taking place, about the third or fourth day, a dressing of zinc ointment is to be substituted for the wash; this allows the skin to heal. When suppuration is established, a zinc lotion may be used after a week or ten days, and the cure wrought out on ordinary principles. The following abstracts of cases may be considered good specimens:—

S. B., a lad between 11 and 12 years of age, on the 8th June, in company with some other boys, was amusing himself with gunpowder—a "*peeoye*" (or devil) hung fire, and he poured some powder on it from the flask. This of course exploded, and tore open the metacarpal space between the thumb and forefinger of the right hand. The metacarpal bone of the thumb was fractured, and both wrists scorched. A mass of the short flexors of the thumb was forced out of the wound, contused, torn, and blackened. As this muscular substance was much injured, and could not be returned without using undue force, a good deal of it was cut off; the wound was washed out with the sulphurous acid lotion, covered with a rag wet with the same, and the fracture was kept in position by tying the thumb to the forefinger. Had a fair night's rest; the wrists (not complained of yesterday) now painful, and beginning to vesicate, dressed with carbolic acid and oil. Everything went on well: the burns on the wrist healed kindly, suppuration was most moderate, cicatrization rapid and perfect. I lately passed the boy into a public work, with a thumb very little, if at all, the worse of the accident.

C. D.—10*th June.*—Summoned to a young woman, reported to have had her hand seriously injured by machinery; found the first and ring fingers of the left hand much contused, with a considerable surface of skin abraded; the middle finger of same hand so much injured as to require amputation at the carpo-phalangeal joint. This was done under the influence of chloroform, and all the wounds dressed with the sulphurous acid wash. The stump healed without one drop of pus having been formed, and the other injuries did admirably.

Master D. E., on 29th July, was swinging on a rather high gate, fell over, and his forehead coming on a sharp stone, an irregular wound, about two inches in length, was the result. As there was much gaping, a stitch was required to bring the edges together, the wound having been previously well washed out with the sulphurous acid lotion; it was afterwards covered with a rag wet with the same. The whole healed by the first intention.

Snake-Bites.—The cobra or spectacled snake.—I observe that Dr Fayrer of Calcutta has been experimenting with the cobra in India, and appears to doubt the possibility of saving a case in which the venom was allowed to enter the circulation. I should think many a medical man in India might have given cases to prove the opposite; but as no one appears to have done so, I beg to submit two in which the men recovered, and in which there could be no doubt that the cobra was the snake which inflicted the injury.

Both occurred during my residence at Bareilly in Rohilkund—the first in a prisoner who was employed in re-tiling the house of Vincent Tregear, Esq., Principal of the Bareilly College. In removing the tiles, the man was bit by a small cobra. Mr Tregear was at once called, and gave him a full dose of liquor ammoniæ, and then despatched him to my house, which he reached probably in three minutes. The ammonia was at once repeated, and continued every two or three minutes with increasing intervals, the man being walked up and down between two others. The snake was killed, bottled, and long kept by Mr Tregear, and was an undoubted cobra. The second case occurred still nearer home. My friend, E. M. Wylly, Esq., B.C.S., shared my bungalow; his khansamah (or butler) was an oldish man, who, like many natives, kept a pet parrot in a small iron cage. Rising at early dawn one morning, according to custom, he was removing his pet into the open air, and did not observe that a pretty large cobra had during the night entered the cage, swallowed the feathered favourite, and been trapped by its undigested body when he would have retired. Of course, the head and anterior part of the snake's body could pass out between the bars of the cage, and so the poor old man was bitten about the wrist. I was dressing at the time this occurred, and in less than half a minute had the patient in my verandah, with a full dose of ammonia over his throat; and then he was kept walking up and down between two men, getting further supplies of ammonia every two or three minutes. In half an hour I was able to proceed on my rounds and leave the patient in charge of a native doctor; and in an hour or so he was safe. Next day he was at work as usual, only complaining of a very sore throat from the strength of the ammonia he had swallowed.

Of course there must be no delay in the administration of the remedy. I once lost a case in which probably not more than five minutes had elapsed from the time the bite was inflicted; but in that short time the patient had become unable to swallow. It is also very probable that Professor Halford's (of Melbourne) method of injecting the ammonia into a vein may be more certain than the plan of giving by the mouth, and it may give a chance even after the power of deglutition is lost.

Vaccination.—How I wish I could transport some of our vaccinophobists to India, and show them the suffering mortality there caused by smallpox among an unprotected population, and also the confidence and safety with which all who have been properly vaccinated can go through the midst of the pestilence. The following anecdote may be interesting:—While civil surgeon of Bareilly I had five vaccinators under me. These had, previous to my advent, been employed in the city itself only; but being desirous of extending their operations, I retained two only for the city, and sent the three others to large towns in the district, giving them letters to the darogahs (or chief officials) requesting them to assist the men. One of them was providentially a European, and he rather surprised me by writing in a short time that the natives were in a great ferment about the vaccinator, that women and children rushed out into the jungle as soon as his advent was reported, and that the prevailing opinion was that the Europeans were doing "Jadoo" (witchcraft), drawing blood from the children's arms that we might be successful in the war then going on (the first Sikkh campaign). I of course recalled my vaccinators at once, and thought that was the end of the affair. Not it. There was a serious epidemic of smallpox that season. In that village almost no young child escaped, and the mortality was awful. But a few children who had been vaccinated (almost by force, I believe) continued well, though mingling with the diseased around them. This astonished the natives, and at *their own request* I next year sent out my vaccinator among them, and continued to do so with success as long as I remained in the district.

ARTICLE V.—*Case of Sudden Death from an Aneurism of the Arch bursting into the Pericardium.* By HENRY A. LEDIARD, M.B., M.R.C.S.

JANET M., aged 60, lodging-house keeper, came under observation at the end of March 1871. For the last month or two she has been troubled with a cough, accompanied with slight spit. Two or three weeks ago she first began to feel a choking in the throat, together with occasional fits of difficulty of breathing.

The following facts were noted:—Expression anxious, left pupil larger than the right, some visible pulsation at the root of the neck; a distinct, though slight, heaving felt over the upper part of the sternum. Over the heaving area a systolic bruit is heard, which is most audible at the left edge of the sternum, on a level with the first costal cartilage. Percussion over the upper part of the sternum is dull; percussion under the clavicles is normal. The jugulars are distended, especially on the right side; they do not fill from below. The radials are hard and tortuous, and do not beat synchronously. The first sound at the apex is normal, and the second sound is heard with some accentuation. No rheumatic pains complained of. The cough is somewhat husky and not urgent; occasional fits of dyspnœa complained of, together with a soreness in the throat, which is referred to the box of the larynx.

She remained under observation for ten days, during which time nothing further was noted; she was not seen again until a week before her death. The last notes taken before death were as follows:—There is almost complete aphonia; a well-marked heaving is seen over the whole of the upper part of the sternum; there is a loud systolic murmur and absolute dulness over the heaving area; great dyspnœa. When first seen it was considered highly probable that she was the subject of aneurism of the arch, and when seen again, just before her death, this diagnosis was rendered tolerably certain. About the middle of September, she fell down dead in the street. This termination to the case only served to corroborate the diagnosis; the aneurism must have ruptured.

On post-mortem examination, a large aneurism of the ascending and transverse portions of the arch was found; it had ruptured into the pericardium at the point of reflexion of that membrane from the ascending part of the arch; the orifice was about the size of a split pea. In the pericardium were six or eight ounces of recent blood-clot, together with a proportionate quantity of bloody serum.

There was a small amount of decolorized fibrine within the aneurismal sac, which was scarcely adherent to its walls. The anterior wall of the tumour was attached to the upper portion of the sternum, the left carotid artery being obliterated. The heart was slightly hypertrophied; aortic valves competent. A cast was taken of the interior of the aneurism, which measured ten inches in circumference at its widest part.

ARTICLE VI.—*A few words on Vaccination and Revaccination.* By F. PAGE ATKINSON, M.D., etc., late Surgeon St Bartholomew's Hospital, Chatham, and Royal South London Dispensary.

THE following notes, regarding vaccination and revaccination, have been put together for the purpose of showing how false many of the prevailing ideas on the subject are, and saving time and trouble to those who are engaged in trying to find out the real truth regarding it.

It appears now to be fully acknowledged by medical men—

1. That vaccination, though it greatly lessens the susceptibility of taking smallpox, does not render the reception of it in after years altogether impossible.
2. That vaccination in most cases greatly modifies the character of the smallpox eruption, and lessens the severity of the attack.
3. That revaccination gives an absolute (?) immunity from smallpox.

The reasons for their coming to these conclusions are as clear as they possibly can be, and there cannot be the smallest allowance made for people who wilfully oppose such arguments as the following:—

Dr A. C. C. De Renzy, Sanitary Commissioner in the Punjab, says, "In this province, with a population of 18,000,000, the deaths from smallpox are never less than 20,000 a year. In 1869 they numbered 53,195." In England the annual average mortality does not exceed 5000, though previous to the introduction of vaccination it was quite as high as in the Punjab.

The facts, again, concerning vaccination in Scotland and Ireland, supplied to Dr Anstie by Dr Seaton of the Privy Council, speak for themselves as plainly as facts possibly can do.

In the former country it appears there was no Vaccination Act prior to 1863, and the average yearly deaths from smallpox in the twelve years 1853–64 were 1054. In 1865, '66, '67, '68 they were respectively 175, 200, 124, and 25.

In Ireland vaccination was not compulsory before 1863, and in the periods 1830–40, 1840–50, and 1850–60, the respective annual average mortalities were 5800, 3827, and 1272. In the years 1864, '65, '66, '67, '68 they were respectively 854, 347, 187, 20, and 19. In the first quarter of 1869, again, there were only 3 deaths, and in the second, none. Let any one who is sceptical as regards the advantages to be derived from vaccination pass in review the valuable evidence of Mr Marson, at the Smallpox Hospital (London). In 5000 cases of post-vaccinal smallpox, under observation from 1836 to 1855, it appears there were—

35 per cent. of deaths among those that were unvaccinated;
25·57 among those that stated they had been vaccinated, but exhibited no cicatrix.

Among those that had

1 cicatrix, the number of deaths per cent. was	7·73
2 cicatrices, ...	4·70
3 do., ...	1·95
4 or more, ...	0·55

The percentage of deaths among those that had well-marked cicatrices was 2·52, and 8·82 among those that had badly-marked cicatrices. Among those that had had smallpox previously it was 19.

In Pinchbeck, Lincolnshire, with a population of about 3000 inhabitants, only one death has occurred from smallpox during the last thirty years, and this was in the case of an unvaccinated person. The medical officer of the district has three times received the government grant for efficient vaccination. Dr Seaton, in his evidence before the Select Committee, stated that vaccination had the effect of reducing the mortality of children under five years of age. In Scotland the infantile mortality has been reduced from 70 or 80 per cent. to 55. In Greenock the mortality under five years of age has been reduced to 36 per cent., and in Glasgow to 28 per cent.

In the *Lancet* of 8th April 1871, the following statement occurred:—"Not a single revaccinated case has been admitted into the Smallpox Hospital at Homerton, and no death of a vaccinated person has occurred under 17." "This," as the editor remarked, "shows the protective power of *even imperfect* vaccination up to puberty, and the necessity for revaccination at this time."

The strongest case one can advance in support of revaccination is the fact that not a single nurse has died at the Smallpox Hospital for the last thirty years, in spite of the infection to which they are constantly exposed. As regards the lymph fit for the purpose of vaccination a good deal of doubt seems to exist. Some say that carefully-selected matter from revaccinated cases is as sure in its effects as that taken from primary vesicles; others, that secondary vaccine matter is of very little use, and that only that taken from the arms of infants should be used; while others assert that the lymph taken from children has become deteriorated by passing through so many different systems, and that a fresh supply should be obtained from the original source. Now, with regard to the use of secondary matter, there can be no doubt that it is capable of setting up the same constitutional disturbance, and producing the same kind of vesicles, as lymph taken from primary cases; but still it not unfrequently happens that the vesicles are unduly hastened or otherwise irregular in their development. And from a review of the facts mentioned in the *Lancet*, 29th July 1871, by Dr Barbour of the Stockwell Fever Hospital, I would say that the amount of protection to be gained from its use is very small, and that it should only be employed under very exceptional circumstances. Where none other for the time being can be obtained, and revaccination is imperatively demanded, Bryce's test should certainly be employed in order to see whether it has efficiently performed the purpose for which it was intended or not; in other words, lymph should be again inserted into the arm a few days after the first vaccination. If both vesicles maturate, and also die away at the same time, then the first operation may be considered to have produced the desired effect; but if the second vesicle goes through all the stages of the primary vesicle, then the first operation has been a mere local affection, and has really exercised no *protective* influence whatever. The following case occurred in my own experience:—A lady who had apparently been successfully vaccinated with secondary lymph, was one month subsequently revaccinated with primary. The resulting vesicles were as perfect in every respect, and went through exactly the same course, as those occurring from a regular primary vaccination. This was a proof, then, that the first operation produced a local effect only, and that it was incapable of affording protection against the infection of smallpox. In answer to those who affirm that vaccine matter loses its effect by constant use, I would say, for the same reason, the poison of fever ought to become less virulent and infectious each succeeding year; but this is not the case, for though, owing to altered atmospheric influence, prevailing epidemics may for a time die out, they soon return when the conditions are again favourable, with all their former activity. But, in addition to this, let us see what opinion Jenner held upon the subject. After a careful watching of vaccination for upwards of twenty years or more, during which time lymph had been successively transferred from subject to subject, he came to the conclusion that it underwent no change whatever in its qualities. Marson, Ceely, and others also, whose experience is very great, have proved, so far as such matters admit of proof, that vaccine lymph does not lose any of its prophylactic power by a continued transit through successive subjects. When lymph degenerates in transmission, it is invariably due either to want of proper care in the selection of subjects, or to inattention to certain details essential to successful vaccination. But let us now, for one minute, consider the evidence of some of those who have experimented with lymph taken directly from the heifer.

During the seige of Paris, Dr Quinquand had all successful cases with the human lymph, but only one-third with heifers'.

Dr Thevenot, with calf-vaccine, had only 2 successful cases out of 21.

Of 32 surgeons in Paris who sent in their reports, one says that vaccine from the calf became better after passing through the systems of three or four different children, though bad and difficult to introduce for the first time. The rest (31) agree that vaccination from the calf was provokingly unsuccessful, succeeding at the very utmost only in a fourth of the children vaccinated directly, and much less from calf-virus tubes or glasses. Of 16 others who tried the calf-virus 13 failed completely.

Dr Gaillard, who succeeded 170 times out of 283 with calf-vaccine, was successful 2740 times out of 2856 with Jennerian vaccine.

The next question, about which some amount of uncertainty prevails, is as to whether syphilis and other diseases can be conveyed by vaccination. Mr Hutchinson has lately brought forward a series of cases to prove that syphilis is capable of being so conveyed; and, to say the least, they certainly appear to wear a very suspicious aspect. Still it must be remembered that, in 1857, Mr Simon (Medical Officer of the General Board of Health) addressed a series of questions upon this very subject to a large number of medical men, both in this and other countries, and received answers from no less than 539, with scarcely an exception, entirely in the negative. They declared that syphilis could not be conveyed by means of true vaccination; but they pointed out that, by gross carelessness, it might be inoculated *instead of* vaccine. The direct experiments, moreover, of Cullerier and others with mixtures of syphilitic matter and vaccine, and vaccine matter taken from persons suffering from constitutional syphilis, are most powerful arguments against the idea that syphilis is able to be transmitted by means of lymph taken out of a true Jennerian vesicle. To show that two poisons cannot be present in a true Jennerian vesicle, lymph may be taken from a vesicle developed in a person who has been vaccinated too late to prevent smallpox, and used without the slightest hesitation for vaccinating another child. It would certainly appear, from these facts, that vaccination as such cannot convey syphilis with it, though a syphilized lancet or blood taken up with lymph from a syphilitic infant may cause it to break out in persons subsequently operated upon. It might, nevertheless, be as well to do as Mr Hutchinson suggests—viz., to avoid taking lymph from first-born children, and take it only from second or later born children, in families of which the oldest has enjoyed good health. As regards the idea of scrofula being conveyed by vaccination, there can be no doubt, as the *Lancet* says, that "it is a mistake. Its development is, on the contrary, greatly prevented, inasmuch as smallpox, by weakening the system, was often the occasion of scrofulous and tubercular disease. Again, when skin eruptions are occasioned by vaccination, the fault is not necessarily with the matter, but with the constitution of the child vaccinated, which cannot bear even the slight disturbance of vaccination with impunity; and *a fortiori* cannot bear the destructive disturbance of smallpox, which is the almost certain alternative."

Among the instructions lately issued by the Lords of the Privy Council, are to be noticed the following:—

"Never take lymph from cases of revaccination. Never use or furnish lymph which has the slightest admixture of blood. Take lymph only from well-characterized, uninjured vesicles, at the stage (the day week after vaccination) when they are fully formed and plump, but there is no perceptible commencement of areola. Take lymph only, which, as it issues from the vesicle, is perfectly clear and transparent, and none which is at all thin and watery. Never squeeze or drain any vesicle. From such a vesicle as vaccination by puncture commonly produces, do not, under ordinary circumstances, take more lymph than will suffice for the immediate vaccination of five subjects, or for charging seven ivory points, or filling three capillary tubes; and from larger or smaller vesicles take only in proportion to their size. Be careful never to transfer blood from the subject you vaccinate to the subject from whom you take lymph. Note any case wherein the vaccine vesicle is unduly hastened, or otherwise irregular in its development; and if similar results occur in other cases vaccinated with the same lymph, desist at once from employing it. Change the lymph if on the day week after vaccination the vesicles are not entirely free from areolæ. Keep the lancets and other instruments used scrupulously clean, and do not use them for other surgical operations. Cleanse the instruments used thoroughly after one operation before proceeding to another.

"Except so far as any immediate danger of smallpox may require, vaccinate only subjects who are in good health. As regards infants, ascertain that there is not any febrile state, nor any irritation of the bowels, nor any unhealthy state of skin—especially no chafing or eczema behind the ears, or in the groin, or elsewhere in folds of skin. Do not, except of necessity, vaccinate in cases where there has been recent exposure to the infection of measles or scarlatina, nor where erysipelas is prevailing in or about the place of residence. Take lymph only from subjects who are in good health, and, as far as you can ascertain, of healthy parentage, preferring children whose families are known to you, and who have elder brothers or sisters of undoubted healthiness. Carefully examine as to skin disease and signs of hereditary syphilis."

There can be no doubt that the past epidemic has had the effect of causing several disputed points to be finally set at rest, and, among these, the question as to whether it was right to vaccinate women who were pregnant. The old idea was, that vaccine, being a poison similar to that of smallpox, would cause abortion to take place, but this has been contradicted by all the first obstetricians. Next it was thought unsafe to vaccinate children much under six weeks, whereas the medical officer of the Privy Council has distinctly advised that children who are exposed to the influence of the smallpox poison should be vaccinated within a week of their birth. It was also supposed to be dangerous to revaccinate elderly people, but this has been shown to be incorrect. There can be no question that grown-up people suffer, generally speaking, more from vaccination than children, the same as they do when attacked by measles, whooping-cough, etc., and this I believe has given rise to the idea of vaccination affecting people worse during what is termed a varioloid state of atmosphere.

The materials used for collecting lymph are—1. Ivory points. 2. Glasses. 3. Capillary tubes. The last-named are the best, inasmuch as the lymph is always kept in a fresh state.

The methods employed for vaccinating are—1. Puncturing. 2. Scratching. 3. Blistering.

The last-mentioned (introduced by Mr Ellis of London) is supposed to render the absorption of the lymph more certain, but it most undoubtedly entails a greater amount of trouble, and I cannot say from my own experience that it ensures a greater amount of success than either puncturing or scratching when carefully done. In a few instances, I have seen very bad arms result from this method. The effects produced by revaccination are not, generally speaking, the same as those which exhibit themselves after primary vaccination. As far as I can see myself, the effect of the vaccine manifests itself in three different ways:—

1. There may be a perfect vesicle passing through all the different stages, showing that the protective effects of the first vaccination have entirely passed away.

2. There may be a scab formed, but no *distinct* vesicle, showing that the protective effects of the first vaccination only partially remain.

3. There may be only slight redness produced, showing the protective effects of the first vaccination remain perfect, or nearly so.

In all cases, I think, where there is not a perfect vesicle, revaccination should be tried again, in order that the operation may not hereafter from carelessness fall into disrepute.

In order that the general public may learn the benefits resulting from vaccination and revaccination, all possible information should be afforded them on the subject, and medical men should be particularly anxious not to let any discredit fall upon the operation from a want of proper care. Once let the public be fully convinced of the fact that they cannot possibly receive harm from the inoculation of vaccine matter, and we may have the satisfaction of seeing smallpox in time banished from our shores.

In this paper extracts have been made from,—Edinburgh Medical Journal—British Medical Journal—Practitioner—Lancet—Macdowall's Medical and Surgical Aspects of the Siege of Paris—Marson on Smallpox and Vaccination—Instructions issued by the Privy Council.

ARTICLE VII.—*On Dementia.* By STRETHILL H. WRIGHT, M.D., Senior Assistant Physician, Royal Edinburgh Asylum, Morningside.

BY the term Dementia is understood the condition of one whose mental capacity, from any cause, is deteriorated from its normal standard. This mental impairment may vary in extent; it may be lasting or temporary.

I would shortly consider this state of dementia, dividing the disorder for the purpose into three varieties; and giving with the description of each variety a short summary of a case typical of the class to which it belongs.

The two principal divisions under which cases of dementia naturally resolve themselves are irrecoverable and recoverable—those in which there is no hope of the patient ever regaining the normal mental energy, and those in which the power of recovery is not lost.

As a good instance of the first form, irrecoverable or chronic dementia, I shall quote the leading features in the history of Mr H. This gentleman has been a patient in the Royal Edinburgh Asylum for the last twenty-one years. Before his admission he had been under treatment in other asylums.

The primary symptoms of mental disorder were those of great excitement; and he was placed in this Asylum, as his friends found it impossible to manage him at home on account of his violence of temper and imperiousness of manner. On admission he is reported as being almost in a state of fatuity. In a later report he is said to speak childishly, making a wrong use of words, such as did not express the meaning he evidently wished to convey. From that date, no change has taken place in this gentleman's condition: he is still an inmate of the Asylum, and his condition is fully described by likening him to a good but densely stupid boy. His appearance, considering his age (50), is very puerile; he is very easily managed, and, except an occasional pettishness, never gives any trouble whatsoever. This case, then, affords a very good example of the chronic dement. The bodily health is good, even robust; but the mental capacity is greatly deteriorated. The patient is a man, with the capacity of a child. He is easily amused, and is often as easily made irritable and peevish by the slightest annoyance or disappointment.

Little or nothing can be done medically for this state of mind. But under careful moral regulation and discipline, the irritability and proclivity to mischief, which many dements display, can be restrained; and the patient may lead a contented, happy, and, according to the measure of capacity which remains to him, even a useful life.

Intermediate between irrecoverable dementia, and that transitory impairment of mental capacity which, in greater or less intensity, results in the cessation of all attacks of mental excitement, is a form of dementia distinct from both, but forming a connecting link between them.

Frequently mental disorder depends upon the existence of bodily disease which tends to run a fatal course, and gradually to exhaust the resources of the constitution. In such cases, the first symptoms of mental derangement are of an acute character. The patient labours under acute mania or melancholy. Then, as the constitutional vigour is undermined by the progress of the bodily disease, the mental symptoms assume a more and more demented type. This form of dementia differs from typical chronic dementia by the nature of the transitory improvements which occur in the mental condition. When the bodily disorder remits, the mental powers rally. But it is with equal sharpness distinguished from "recoverable dementia," by the fact that these remedial efforts are merely transitory and abortive in their nature. A steady progressive advance from a state of dementia to mental competency is characteristic of the third form, "Recoverable dementia," alone.

Of this intermediate form, the case of Mrs S. affords an example. In this woman's case excitement supervened upon hæmorrhage after abortion, so severe as to induce syncope and great lowering of the general vitality. After a period of violent excitement she became demented, in which state her bodily condition is noted as "rather weak and infirm" Again, she is described as gaining strength, as being cheerful, and improved in her mental health. She is afterwards reported to have had fits of excitement at her menstrual periods; and finally to have become demented, in which state she died of phthisis pulmonalis. She was demented to the last.

In this case great mental excitement was produced in an exhausted constitution; to this a state of dementia succeeded. The constitution then made certain efforts at repair, giving results in the recovery of a certain amount of mental capacity. These efforts proved abortive from the constitutional tendency to wasting disease; and the patient's mind again sank into a state of irrecoverable dementia, in which she died.

Lastly, "Recoverable dementia" occurs as a stage in the progress of those cases where insanity does not depend upon constitutional disorders tending to progressive deterioration of structure, but upon specific disease which tends towards recovery.

Dementia of greater or less severity is so frequently a sequela in all cases of acute mental disorder, that it may almost be considered as constant.

The best examples of this "Recoverable dementia" are afforded by those cases in which insanity supervenes on acute bodily disease, or severe constitutional trial, as prolonged starvation, etc. Puerperal insanity is very constantly followed by a well-marked period of dementia, from which the patient emerges to a normal state of sanity. In the following case, this is exemplified:—

Mrs B.'s was a case of puerperal insanity. In the course of her mental disorder and recovery from it, this patient displayed symptoms of depression, followed by excitement; she then sank into a state of dementia: in which condition she remained for some time, and from which she *gradually* emerged to the normal exercise of her faculties Her illness lasted ten weeks in all.

As in the case of the other tissues, after severe disease involving loss of substance, there is excessive irritability of the new formation, so in the brain, the display of great prolonged excitement. "Convalescent dements" are often very nervous and excitable. May it not be the case, that there is loss of substance or impairment in the quality of brain-substance formed during the acute stage, which, during the stage of dementia, is gradually replaced by material of the normal standard? It is certain that, as convalescence goes on, and progressive improvement is made in the general health, the mental powers gain strength and stability *pari passu*, and the irritability gradually disappears.

Finally, I would submit that—

"The mental" condition, "Dementia," may be naturally and usefully considered under three varieties.

That patients whose dementia belongs to the first variety have, so to speak, permanently assumed a lower stage in the mental scale. As they enjoy good bodily health, and the mental deficiency does not depend upon active constitutional disease, they are not so much subjects for medical treatment as for judicious moral discipline and control. That the treatment of cases belonging to the second variety is palliative; although by careful management the lives of such patients may be prolonged and their mental disorder ameliorated. And, finally, that in all attacks of acute mental disorder of any gravity, a stage of dementia is a constant stage towards recovery; and that the fact of a patient passing from a stage of acute mania or melancholia into a state of dementia, should be looked upon as rather a hopeful symptom than otherwise; as such a condition of the mental faculties is very constantly in such cases found to be precursory of the re-establishment of sanity.

ARTICLE VIII.—*On Atmospheric Influences.* By JOHN BOYD, M.D., Slamannan.

To gentlemen in town practice the state of the weather is usually only of subordinate importance. The physician's brougham, the *fiacre*, or the omnibus, not only aid locomotion, but protect the city practitioner from adverse skyey influences; while to him who trusteth in his own extensors, adductors, and gastrocnemii, the lee side of the street is open to his election. But to Gideon Gray the barometer and the vane are objects of no little consequence. The degree of atmospheric pressure and the direction of the wind practically decide whether the day is to be one of that tranquil yet vivid enjoyment attendant on brisk motion in genial air, or one of stern endurance, despite of the invaluable waterproof protections nowadays available, which were unknown when the father of the Surgeon's Daughter circulated around Middlemas, otherwise known as Selkirk. Yet considerations of greater magnitude than personal comfort are involved in the state of the weather. The observant and experienced medico very frequently finds that when he sets out in the early forenoon, the atmospheric portents inform him as to the condition in which he will find a large proportion of his patients. With a southerly wind and moist tepid temperature zymotic cases will spread; after a south-west storm and the equinoctial gales, an epidemic of good health will frequently break out; but the phenomena attendant on the east winds more particularly claim our attention.

The climate of Scotland, notwithstanding the progress of population and cultivation, may well be now described much in the same terms as Buchanan depicted it three centuries ago,[1]—gloomy and cloudy, with mild winters, rainy rather than snowy. The prevalence of south-west winds loaded with Atlantic vapours, and comparatively high in temperature, explain these clearly. An average of seven years, observed by Dr Meek, in the neighbourhood of Glasgow, gives—

Winds.	Days.
South-west, ...	174
North-west, ...	40
North-east, ...	104
South-east, ...	47

In January, March, April, and June, the north-east, generally termed the east, wind prevails; some years more continuously and uninterruptedly than others. From the beginning of December 1865 to the end of June 1866 there was scarcely a day's intermission from the cold, dry, piercing east wind, with bright sunshine during the day and frost at night. During that lengthened period the low temperature gave rise to many ailments—toothache, neuralgia of the fifth pair, lumbago, sciatica; as also to severe visceral inflammations. Pneumonia prevailed a good deal, and was highly acute and sthenic in character; but in nearly every case there was hepatic complication, fulness and tenderness in the right hypochondrium, duskiness of complexion, yellow-coated tongue, yellowness of the conjunctiva, amounting frequently to distinct jaundice; while the urine, high-coloured and turbid, high in specific gravity, stained the linen or cotton rag very unmistakably yellow. The colour of the fæces was sometimes pipeclay, at others blackish and greenish. I had previously noticed the coincidence—biliary derangement with the east wind—but the long continuance of such atmospheric currents accompanying so invariably the phenomena referred to in that year, made it obvious that something more than coincidence existed. Ever since I have remarked, that when the wind is longer than three days in that direction cases present an imperative demand for the administration of cholagogues; and at no season more forcibly than last spring. The depressing influence of non-eliminated or insufficiently excreted bile on the mental faculties and spirits has long been known, and the jolly curative regimen, "lecto etiam et conclavi cultiore, lusu, joco, ludis, lasciviâ per quæ mens exhilaretur; ob quæ regius morbo dictus videtur," laid down in lib. iii. cap. xxiv. of Celsus, is not ignored by professional readers. But more than depression of spirits has been recognised as resulting from bile so retained, from the state of the weather—a peculiarly morose and unwholesome tone of the public mind—a tendency to harshness and severity, more especially distinguishable in those ranks of the population who are least likely to restrain their sentiments and emotions from considerations of fairness or social forbearance, and on whom a very decided improvement might reasonably be looked for, after being thirty years subjected to a well-regulated *compulsory* education. Even among the most cultivated classes such influences are observed occasionally to prevail; the bodily *malaise* warping the judgment as well as giving acidity to the feelings. The humane and philosophical Beccaria[1] recognises such conditions as possibly tending to pervert the very administration of public justice. With regard to the pathological appearances accompanying the symptoms referred to, I am unable to give any exact descriptions from my own observation. The only case where death occurred was an elderly female, who for several years became distinctly jaundiced whenever the east wind lasted a week; and here there were strong indications of malignant deposit on the liver. Permission to make a post-mortem examination was refused.

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[1] Rerum Scoticarum Historia, liber primus, cap. i.: "Aër raro serenus, sed caligine densa plærumque obscurus, ac hyeme satis miti magis pluvius, quam nivosus."

As to treatment, a few doses of calomel and rhubarb, followed by salines, in general sufficed to give relief to the sufferers; but fancying, latterly, that a tendency to rapid mercurialization was frequent, I gave full doses of podophylli resinæ, gr. j., c. ext. hyoscyami gr. j., in pills, which, repeated daily for two or three successive days, and followed when necessary by sulphas magnesiæ, answered admirably. The comparative bulkiness of chloridi ammoniæ renders it less eligible than the above pills, highly valued as it is in German practice. Nitric acid in infus. quassia vel calumbæ operated very satisfactorily afterwards as tonic cholagogues. For the sympathetic neuralgic maladies, I found in innumerable instances the hypodermic injection of ʒss. and upwards of liquor morphiæ hydrochloratis to give immediate, and often lasting, relief. In using Dr Wood's syringe and tube I found no advantage of a concentrated solution over the Pharmacopœia liquor; the former being apt to deposit, on standing, much of the morphia in a flocculent precipitate, while the amount of alcohol in the latter never gave rise to any inconvenience, even when applied to delicate females. The lively sensation of heat experienced after the injection seemed to bear a close relation to the anodyne effects that followed.

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[1] Dei Delitti e delle Pene, edizione sesto, p. 24: "Quindi veggiamo la sorte di un cittadino cambiarsi spesse volte nel passagio che fa a diverse Tribunali, e le vite de' miserabili essere la vittima dei falsi raziocinj, o *dell' attuale fermento degli umori d' un Giudice*," etc.

While discussing the above topic with a friend from the metropolis, of eminent ability and experience, he mentioned that, in addition to lumbago and sciatica, he had frequently met with a neuralgic affection of the calcaneum, which would only yield to treatment by attacking the liver.

ARTICLE IX.—*Case of Puerperal Scarlet Fever.* By JAMES YOUNG, M.D., F.A.S., Treas. Obs. Soc. Edin.

MRS G., æt. 25, was married on the 13th April 1870. She informs me that she has always enjoyed good health, and that her menstruation was regular until the last week of July 1870, when it ceased. A male child was born on the 16th April 1871. The labour, which lasted from 3 P.M. until 9.30 P.M., was natural and easy, with normal presentation. The child was well developed and healthy. On the 17th inst. the mother seemed quite well, and gave promise of a good recovery. On the morning of the 18th, Mrs G. was seized with a severe rigor, and on my visit I found her very feverish, and complaining of intense nausea and giddiness, with severe uterine pain, followed by complete suppression of the lochial discharge; pulse 100, and tongue furred. These symptoms continued until the next day (the 19th), when a scarlet eruption spread over her face and neck, rapidly extending over the body. Tongue somewhat red, the throat slightly inflamed, urine very scanty, intense thirst, total disinclination for food, pulse 130. The uterine pain continued for two days, but was relieved by the application of turpentine stupes. The treatment pursued at this stage was simple, and consisted of the occasional administration of mercurial purgatives, and moderately warm covering, with drachm doses of the aqua acetatis ammoniæ every three hours. The scarlet eruption was well developed for five days. On the 20th, the pulse rose to 136, and was feeble, the patient becoming somewhat incoherent. No application to the throat was necessary. The treatment was now considerably changed, and the usual dose of the tincture of the muriate of iron was commenced, and repeated every three hours. A large glass of claret was given four times a day, beaf-tea and milk nearly *ad libitum;* chlorate of potash, in scruple doses, with hydrochloric acid, in water, was given frequently as a drink. Brandy was substituted for the claret on the

26th, and half a glass was given in water every three hours till the 28th, when the pulse began to fall to 124. The patient made a slow but perfect recovery, being confined to bed until the 15th May, by which time she was able to sit up a little every day. Desquamation of the cuticle commenced on the 6th May. There was no dropsical effusion, and never any secretion of milk. She did not menstruate for three months after her recovery.

ARTICLE X.—*Clinical Lectures on Diseases of the Heart.* By GEORGE W. BALFOUR, M.D., F.R.C.P., Physician to the Royal Infirmary, Edinburgh.

I.—*On the Murmurs and other Physical Signs Distinctive of Mitral Stenosis.*

GENTLEMEN,—Were I to ask you to tell me what sign you suppose to be most distinctive of disease of the mitral valves, probably nine out of every ten would, without hesitation, reply, A systolic murmur loudest at the apex. Yet this, though the belief of a large proportion of medical men, is far from being the truth. A systolic apex murmur is by no means always a certain proof of any positive derangement of the cardiac mechanism. Such a murmur may, as you are aware, be of exocardiac origin, and the valves may in this case remain healthy, and their action perfect, in spite of the persistence of a murmur having the character described. It is even said that a murmur of this kind may be of endocardiac origin, and yet the valvular mechanism remain uninjured; and though such an occurrence must happen but rarely, still it is a possibility which we must never forget in estimating the probabilities in favour of our diagnosis. But systolic apex murmurs originating exocardially, or even endocardially, apart from valvular derangement, are not of course associated with regurgitation backwards into the auricle, and are free from any of the signs and symptoms dependent on that accident; yet, even though regurgitation be unequivocally proved to exist along with a systolic apex bruit, mitral disease or deformity is not therefore a necessary consequent, because both do occur in a not inconsiderable proportion of cases in which the mitral valve is nevertheless perfectly healthy. In fact, the mitral valve may be free from disease, and the auriculo-ventricular opening perfectly natural and undilated, and yet regurgitation may, and often does, take place. How this may be I shall take another opportunity of explaining; it is sufficient for the present to state the fact that, even where mitral regurgitation is clearly established, it is no positive proof of disease of the mitral valve; and I shall presently describe those signs which must coexist to prove this regurgitation to be certainly dependent upon disease of the valves. On the other hand, there is a murmur which is so invariably associated with disease of the mitral valve that, when once heard, it may be conclusively accepted as a distinctive proof of the existence of a permanent deformity, even though the murmur itself should subsequently disappear, as it frequently does. This murmur, which is pathognomonic of mitral stenosis, has been termed, *par excellence*, the presystolic murmur. It is well, however, to remember that this is a misnomer. As the term is, however, a convenient one, and has been long attached to this special murmur, it is perhaps right to continue its use, provided always we recollect that it is merely conventional, and not strictly accurate.

The history of the presystolic murmur commences with M. Fauvel, who, in 1843, not only described its characteristics, and amongst them its rhythm, but actually gave it the name by which it is still best known. British physicians are, however, mainly indebted for a clear understanding of this important murmur to the writings of Dr Gairdner, whose lucid statements and admirable diagrammatic representations were first published in 1861. In Edinburgh this murmur is of such frequent occurrence, so generally recognised, and the recognition verified every session by the discovery of the predicted pathological condition, that it is simply incomprehensible how its existence is still ignored by some even of the most esteemed members of our profession. Not, perhaps, that it is altogether ignored, though that sometimes happens—but its true character is denied, which is perhaps worse.

In estimating the nature of any murmur supposed to be of valvular origin, you are aware that it is absolutely necessary to be precise in ascertaining two facts regarding it: the first being the position on the cardiac area at which it is most distinctly heard, and the second its rhythm; that is, its proper relation to the several acts which constitute a cardiac pulsation. These points being determined, the ascertaining of the lesion upon which the murmur depends is a simple matter of ratiocination, in which it seems hardly possible to err. Now, the murmur I speak of has a fixed position in which it is most distinctly heard—viz., over what has been already described to you as the mitral area; that is, within a circle of about an inch, described round the point where the apex impinges as a centre. It is not much propagated in any direction, and though the educated and experienced ear can readily detect the alteration of the first sound produced by the presence of this murmur, wherever the heart-sounds can be heard, yet it is only over a very limited area that it is audible as a true murmur, being comparatively rarely to be heard above the third rib, while its distinct propagation is, as a rule, almost equally limited in every other direction. To give you some idea of this limitation of propagation, I may mention that there is now in the wards a lad of eighteen with a murmur of this character, so loud and rough that, on his first admission, it was distinctly recognised through three shirts (two of them flannel), a waistcoat, coat, and top-coat; yet this murmur, which I especially investigated to determine the area of propagation, is not audible as a murmur above the third rib, nor below the middle of the sixth interspace; nor farther to the left in the nipple line than a line descending perpendicularly from the anterior border of the axillary space; while on passing to the right it is already less rough at the left edge of the sternum, and is quite lost half an inch beyond its right edge.[1] But though I give this as an excellent illustration of the remarkable limitation of propagation, even in an exceedingly rough and loud presystolic murmur, you are not to conclude that this murmur is always limited to so small an area, because exceptions do occur, though these are certainly much rarer in regard to its propagation than in regard to its character. In accordance, therefore, with the laws of the propagation of murmurs already laid down, this position of audition, as we may term it, stamps this murmur as of mitral origin, and even hints its probable rhythm to the intelligent ear. The rhythm of a murmur is, as you are aware, its relation to the several physiological acts which constitute a complete cardiac pulsation—that is, which occupy the time comprised between two consecutive apex beats. During this period we have the ventricular systole, synchronous with the apex beat and the first sound; the ventricular diastole, synchronous with the second sound, and extending a little beyond it; the period of cardiac rest occupying almost all that remains of the soundless interval; and lastly, the systole of the auricles, which immediately precedes the ventricular systole running into it. In timing any murmur, therefore, we must take the greatest pains to discover whether it takes the place of either the first or the second sound, or if not, then we must ascertain what is the accurate relation of the murmur to these sounds, which of them it precedes, or which of them it follows, and at what interval. Now, in this matter there is this fallacy, that both first and second sounds are not always audible together at apex or base, as the case may be, either in health or disease; and when this is the case in disease, the murmur present is usually taken for the sound wanting. This is specially the case with the murmur of which I am at present speaking, for in the mitral region this murmur is not unfrequently followed by a single loud accentuated sound; and, accordingly, most students at once diagnose the case as one of mitral regurgitation (systolic bruit) with accentuated second sound. This state of affairs is by no means characteristic of the ordinary presystolic murmur, but it accompanies one form of it, of which I shall presently speak; and I mention it now, because the only means of correcting this erroneous diagnosis is to time both the murmur and the sound by placing our finger on the carotid artery, when the murmur will be found immediately to precede and to run up to the carotid pulse, with which the sound is distinctly synchronous. But we know that the carotid pulse is synchronous with the first sound of the heart, and precedes the second one; the sound that we hear is therefore the first sound of the heart, and as the bruit immediately precedes it and runs up to it, it occupies the time of the auricular systole; and inasmuch as the ventricular systole is the first portion of the heart's action giving rise to audible or tangible phenomena, and is usually called the heart's systole *par excellence*, so this murmur has been termed presystolic; but, as I have already said, this is a misnomer—it is truly systolic in rhythm and character—but the systole on which it depends is that of the auricles, and not that of the ventricles; it is an auriculo-systolic murmur. In timing this murmur it is obvious that we must employ the carotid and not the radial pulse; for while the former is always synchronous with the ventricular systole and apex beat, the latter is even in health always delayed to an appreciable extent—one-sixth of a second; while in disease, especially such as interferes with the arterial contractility, this delay is notably increased, and sometimes amounts to an entire cardiac pulsation. A reference to the radial pulse is thus always embarrassing, and may greatly mislead, but a reference to the carotid pulse is a perfectly safe guide, provided we ourselves have senses educated sufficiently to appreciate the teachings obtainable by comparing an audible with a tangible phenomenon. As, in a pretty considerable experience of clinical teaching, I have rarely seen any mistake made in doing this, the difficulties in its way must be but slight; such as they are, they are readily surmounted by the repeated examination in this manner of hearts which are either naturally slow, or have had their action artificially retarded.

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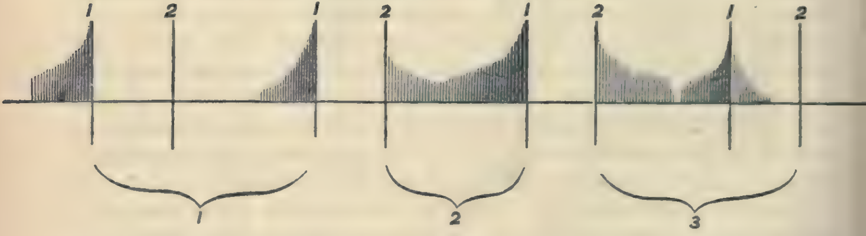
[1] W. C., Ward V.—The murmur in this case passed further to the right than usual. He has since died. His case will be detailed further on, where the reason for this will appear.

Much that is written as to the rarity or even non-existence of this peculiar murmur must surely be chargeable to inattention to this simple, efficient, and necessary diagnostic procedure. There are other murmurs besides this dependent upon mitral constriction, of which we shall presently speak; even this murmur is not always audible when its cause is present, still it is by no means unfrequent, and a due attention to the means described for ascertaining its rhythm and position of audition ought to leave no doubt as to its real character, and just as little as to its frequent occurrence. The peculiar position—in rhythm—of the presystolic murmur has given rise to an arbitrary regarding it as systolic or diastolic, according to the views of the observer. A simple reference to the carotid pulse is sufficient to correct this, and to prove as convincingly as anything sublunary can be proved, that this murmur is preceded by the long pause, and cannot therefore be diastolic, while it precedes both the apex beat and the short pause, and cannot therefore be systolic. With the term post-diastolic, which has been by some applied to this murmur, I have no sympathy whatever; it is an unmeaning expression of an assumed ignorance which does not really exist; for whatever murmur is neither diastolic nor systolic must of necessity be post-diastolic; but as it can hardly occur during the post-diastolic period of rest, when all the causes productive of murmur are in abeyance, it must occupy the time which every physiologist knows to be that of the contraction of the auricle, and is therefore of necessity auriculo-systolic. It is further a direct murmur, a murmur accompanying the onward current of the blood in its natural course through the heart, forcibly produced by muscular contraction. We shall presently see that there are other murmurs, especially of the mitral valve, direct as to the natural current of the blood, but having all the softness characteristic of an indirect or regurgitant murmur, because they are actually diastolic in rhythm and unaccompanied by forcible muscular contraction. This, however, is not the character of the true auriculo-systolic murmur; it is short, because it sharply coincides with the contraction of the auricles; it is also rough, because it is a direct murmur produced by forcible muscular contraction. It has been asserted by some that this loudness and roughness is entirely dependent on the amount of constriction or roughness of the upper surface of the valve; that neither this nor the directness of the murmur are the sole causes of the roughness is conclusively proved by the remarkable manner in which this murmur occasionally disappears, temporarily or permanently, the condition of the valve remaining the same. Something in this may be due to the constitution of the blood, and something also to the varying power of the heart's action; but that these are not all-sufficient is shown by the occasional rapid alterations in the degree of audibility of this murmur—alterations which, as well as the occasional variations in the production and conduction of other cardiac murmurs, are as yet wholly inexplicable.

Various combinations of vowels and consonants have been employed to represent, phonetically, the sounds of cardiac murmurs; and the simple murmur I now speak of is probably that which is most susceptible of being thus treated; the symbols *Rrrb*, or *Vōōt*, when vocalized, conveying to the ear sounds almost identical with those produced within the heart; nay, more, the varying accent with which they may be pronounced accurately represents the changes which are found in different murmurs, or in the same murmur at different times, the last consonant in each symbol being coincident with the apex beat.

Furthermore, sounds are only audible vibrations; and in many cases these are to be felt as well as heard; thus, the rattle of carriages along a street produces a preceptible tremor of the houses in it; and if we strike a tumbler sharply so as to produce a musical note, the vibrations causing this note are readily felt on placing a finger on the edge of the glass, and the sound ceases at once when we stop these vibrations; nay, the sounds produced by friction of the moistened finger along the edges of glasses partially filled with water are not only to be felt as vibrations, but may be seen in the crispation of the water within them. So in like manner the vibrations which give rise to cardiac murmurs may very frequently be felt by the finger at their point of origin; and as they are more readily felt the louder and rougher the murmur is, and as there are few murmurs, if any, so rough as this simple presystolic one, so it more frequently than any other gives rise to a distinct sensation of vibration which is to be felt over the mitral area, giving rise to what is termed the *frémissement cataire*, or purring tremor, rarely, if ever, absent in such cases, and equally with the audible phenomenon, which coincides with it and depends upon a common cause, remarkable for the striking manner in which it runs up to the apex beat and there ceases, which this tremor may be distinctly felt, just as the murmur is heard to do.

A murmur, then, presenting the characteristics just described, rough and capable of being vocalized by the sounds represented by the letters *Rrrb* or *Vōōt*, which is separated from the second sound by a more or less lengthened but always readily appreciable interval, which distinctly precedes the apex beat and the carotid pulse, usually running quite up to them, but occasionally separated from them by an extremely short though appreciable interval, whose rhythm may be thus graphically rendered (fig. 1), and which is (almost) invariably accompanied by a purring tremor over the mitral area, is invariably an evidence of mitral deformity, and is that to which alone is applicable the term, simple presystolic or auriculo-systolic. Once heard and recognised, we are sure that after death we shall find more or less constriction of the auriculo-ventricular opening, more or less deformity of the mitral valve; the murmur may disappear, but the lesion is permanent. The tendency of this murmur to disappear, temporarily or permanently, is in many cases somewhat remarkable, and has given rise to many unlucky *contretemps* not very creditable to practitioners of medicine. For instance—



CASE 1.—I well remember a case in which a patient with a disappearing presystolic murmur possessed quite a bundle of certificates from medical men, one half of which testified that he laboured under organic disease of the heart, while the other half certified, equally strongly, that he was altogether free from cardiac disease. He ultimately died, and the mitral valve was found to be deformed, the opening constricted, and the appendix of the left auricle filled with an organized clot. Of course in every such case there are

various subsidiary phenomena which tend to prove the persistence of the cardiac lesion, apart from the existence of a murmur; but of these I shall presently have to speak more at large; let this case be a warning to you, to pay more attention to those subsidiary phenomena, where you undertake to confirm or controvert the deliberate opinion of a competent medical man, and to avoid basing your opinion as to the existence of cardiac disease on the mere presence or absence of a murmur, either of which may sometimes mislead, though, as I have already said, such a murmur as that just described never does.

The condition of the valve usually, and so far as my own experience goes, invariably, associated with the murmur described, is that which has been termed the diaphragmatic valve, in which the two segments of the mitral are united and stretched like a diaphragm across the auriculo-ventricular opening; the valves themselves are thickened, especially at their edges; sometimes almost cartilaginous in character, their surface usually smooth, though occasionally their edges have a few small and frequently calcareous vegetations attached; the central opening may vary from a small buttonhole, into which the point of the little finger can scarcely be inserted, up to an opening not very much less than normal; in the latter case, however, if the murmur have been at all well marked, the vegetations will be found more numerous and larger than usual. Even where the murmur has been very loud, rough, and persistent, the valve is not therefore rougher or denser than usual; roughness of the murmur is quite independent of roughness of the valve, or even of any remarkable hypertrophy of the auricle, as is very well shown in the following case:—

Case 2.—Margaret Ross was an inmate of Ward XIII. for a whole year, labouring under general dropsy, depending on kidney disease (large white), for which she was repeatedly tapped, etc. What chiefly concerns us now is, that she had a persistent and well-marked rough presystolic bruit, accompanied by a thrill at the apex. On dissection her kidneys were found diseased as expected, her heart was somewhat enlarged, weighing 15 ounces, with milk spots on its anterior surface; the left ventricle was in a state of concentric hypertrophy, but besides this its walls were considerably thickened (this depending on the kidney disease); the segments of the mitral valve were united and thickened throughout, but chiefly at their margins; their surfaces were perfectly smooth, and on the edges of the opening, which was so contracted as only to admit the point of the middle finger, there were one or two minute vegetations; the cordæ tendinæ were contracted and matted together; the aortic valves were competent and natural; the right side of the heart apparently natural.

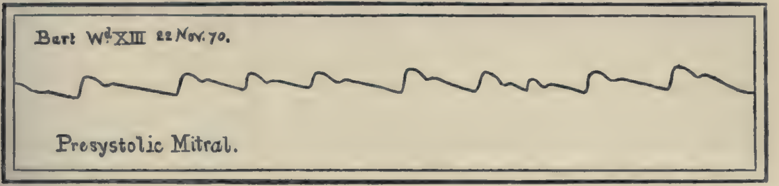
This was a very well marked case, in which the post-mortem phenomena fully confirmed the diagnosis during life, as, I may add, invariably occurs in similar cases.

CASE 3.—William Craig had a presystolic murmur so loud and rough that I have selected it as a measure of the extent to which such murmurs could be propagated. In mapping out the extent of his murmur, I found it to extend so much further to the right than usual that the thought struck me, Is it possible that we can have in this case not only a mitral but also a tricuspid stenosis? But I dismissed the idea as in the highest degree improbable, and referred the great propagation to the loudness and roughness of the mitral murmur. The result shows that in this I was mistaken, though unquestionably there were no other symptoms present but the excessive propagation which could countenance any other opinion. The patient was anæmic, and there were consequently no jugular throbbings present, and the increased transverse dulness of the heart could not of course be regarded as any definite sign of tricuspid stenosis. The patient died of latent pneumonia following, and apparently induced by scattered patches of pulmonary apoplexy, both of which were recognised during life. On opening the thorax, the enormous size of the right auricle at once attracted attention. It measured inside eight inches and a half in circumference by two and three-quarters vertically, and contained a large clot, half an ounce of which was decolorized; its walls were comparatively somewhat thickened, but irregularly so, varying in thickness from one line to a quarter of an inch. The musculi pectinati were singularly well developed. On looking down on the tricuspid valve from the auricular aspect, its segments were found matted together, and the opening so contracted as only to admit the point of the middle finger; the endocardium in its neighbourhood was slightly thickened; a few small vegetations were attached to the free margin of the valve. The right ventricle was slightly dilated; its walls not hypertrophied; the cordæ tendiniæ contracted; and no distinctive trace of the three segments of the valve were to be found. The left auricle was dilated so as to admit a ball two inches in diameter; its walls were not hypertrophied; its endocardium was thickened. The mitral valve from the auricular aspect scarcely admitted the tip of the little finger; its upper surface was covered by many calcareous spiculæ; its free margins beset by a few small vegetations. The left ventricle was apparently normal both as to its walls and cavity. The aortic and pulmonary valves were competent and healthy. The whole heart weighed nine ounces and a half. The rest of the dissection is omitted as unimportant for my present purpose. The boy's illness, according to his own statement, dated only a few months back. There was no history of rheumatism in either of these individuals.

Cases illustrative of this peculiar murmur and its accompanying lesion are of such common occurrence both in the wards and in the pathological theatre that no session passes in which you may not have repeated occasion to verify the statements made. I shall not therefore multiply them here, and shall also reserve statistical details till I come to treat of the relative frequency of the various forms of heart disease.

Of course, with a mitral valve deformed in this manner, closure of its segments is necessarily impossible, and regurgitation to a greater or less extent must of course be present, yet a systolic bruit is very frequently, as in the two cases related, entirely wanting, though occasionally, as I shall presently point out, the systolic bruit is the only one distinctly audible, while in yet a third series of cases both bruits are audible separated by the apex beat.

The pulse in this form of cardiac disease is weakened in proportion to the amount of stenosis present, and is more or less irregular, though not always markedly so, provided no pyrexia coexist; and the accompanying diagram may be accepted as a fair average graphical representation of its condition in such cases:—



But the murmur just described—though that which is certainly most characteristic of diaphragmatic mitral stenosis—is far from being the only one heard in such cases, and of the variously complicated murmurs which may be audible in such a state of the valves, the two following cases afford very striking illustrations:—

Case 4.—Mary Macmurray, aged 31, admitted into Ward XIII. on 26th May 1870, complaining of great pain across the chest, loss of appetite, and general debility. She stated that she had never been very robust, and had suffered from acute and subacute rheumatism on three separate occasions; the first of these attacks occurred nine years ago, the second seven, and the third three years ago. She also suffers almost constantly from chronic rheumatic pains of her limbs and chest. Towards the close of her first attack her head was affected. About ten months ago she began to get more feeble and lost her appetite, suffering also from severe pains in the precordial region, and since that time she has gradually got worse. Her urine was found to be albuminous, containing one-fourth of albumen, specific gravity 1016, acid, normal in quantity, and contained epithelial, granular, and hyaline casts. This kidney affection was her more serious ailment, and was that of which, indeed, she ultimately died; but, in relation to our present subject, her thoracic symptoms were by far the most interesting, and were as follows:—Her pulse was 104 and feeble, both radial pulses alike, and both pupils normal. The heart's apex beat behind the fifth rib, as ascertained by percussion, and two inches and a quarter to the left of the sternum. One inch from the left edge of the sternum the percussion sound was quite clear from the clavicle down to the upper edge of the second rib; from the upper edge of the second to that of the third rib, the sound on percussion was comparatively dull; and perfectly dull from the upper edge of the third rib to the lower edge of the fifth, where the tympanitic stomach sound came in. Along the upper edge of the fourth rib complete dulness extended for a distance of half an inch from the right edge of sternum to two inches and a quarter from its left edge, and comparative dulness for nearly one inch more. Along the lower edge of the second rib the dulness extended for a distance of two inches and three-quarters from the left edge of the sternum. In this dull portion between the second and third ribs on the left side, distinct pulsation is to be felt, less forcible, however, than that of the heart. On auscultating over the apex beat a distinct presystolic bruit was usually but not always audible; the systolic sound was observed roughened and occasionally replaced by a soft blowing murmur; the second sound is followed by a loud musical diastolic murmur. Between the second and third ribs on the right side the first sound was heard muffled, and there was considerable accentuation (sharpness) of the second sound, followed by a diastolic murmur. Between the second and third ribs on the left side close to the sternum, the second sound was more markedly accentuated, and the diastolic bruit more distinct: a little farther to the left the same sounds are heard, and a distinct sense of pulsation is conveyed to the ear by the stethoscope. The accentuation of the second sound and the diastolic bruit are, however, most distinct immediately behind the sternal edge of the second rib at the left side. Into the left subclavian the accentuation of the second sound was distinctly propagated, but not the bruit. Into the left carotid both sounds were propagated, but not distinctly; but into the right carotid and subclavian both sounds were distinctly propagated. On auscultating up the right edge of the sternum, the second sound and diastolic bruit were heard gradually to increase in loudness to the upper edge of the sternum, where it is joined by the first rib, but nowhere on the right do they attain the same loudness and distinctness as on the left. A slight humming murmur was occasionally audible in the veins. For the last month, the patient's urine became more scanty, uræmic vomiting and sickness were frequent, and she gradually sank, and died on the 21st December, the immediate cause of death being a pleuro-pneumonia absolutely latent, and entirely without any subjective symptoms whatever. Her cardiac symptoms remained unchanged. At the autopsy, on 23d December, the lower part of both the right and left lung were found to be hepatized, and were covered externally by a thin layer of perfectly recent lymph, presenting a honeycomb appearance. The left lung was slightly retracted, uncovering the heart to a greater degree than usual. The heart itself was purse-shaped and somewhat enlarged, its substance healthy; the aortic valves were competent, but its cusps were thickened and covered over their whole under surface by numerous vegetations; the mitral valve was thickened and contracted, scarcely admitting two fingers, and with some threads of recent lymph attached to its edge; the upper surface of the aortic segment of this valve was thickly studded with rough stumpy vegetations of varying size. The liver was healthy. The spleen weighed fifteen ounces, and on its posterior border had seven hæmorrhagic infarctions of a triangular shape, and varying from the size of a pea to that of a small bean (the results of embolism), otherwise it was healthy. The kidneys were slightly enlarged; the right weighed five, and the left six ounces. The cortical substance was lessened; the capsule natural, and when peeled off exposed a smooth organ. The intestines were congested, and the rectum and lower part of sigmoid flexure of the colon were thickened.

The next case is perhaps equally instructive, but wants the crucial decision of a post-mortem examination. I shall confine myself solely to the cardiac phenomena:—

Case 5.—J. H., aged 18, was sent up to Ward XIII. convalescent from typhus from the fever house on 6th June 1871. She states that two years ago she had a severe attack of rheumatism which affected all her joints, but not her chest, and lasted for four months. After her recovery she began to suffer from pains in her cardiac region, palpitation of her heart, and shortness of breath on going up stairs. Three months before her attack of typhus fever, from which she has just recovered, she first observed some degree of swelling of her feet. Since her fever the pains in her chest have been more severe, but she has no dyspnœa while lying still in bed. Her pulse is 84, rather small, steady and regular; there is a perceptible thrill over the apex of the heart. The longitudinal dulness of the heart is normal; its transverse dulness in the line of the fourth rib extends from the right edge of the sternum towards the left for a distance of three and a half inches. The apex beat is between the fifth and sixth ribs, three inches and a half from the left edge of the sternum. On auscultation over the apex beat a somewhat prolonged murmur is audible; the first portion of which is rough, and precedes the apex beat, while the latter and softer portion follows it. Between the second and third ribs on the right side there is a systolic murmur prolonged upwards, and followed by a normal though somewhat feeble second sound. Between the second and third ribs on the left side, close to the sternum, there is a systolic murmur, followed by a markedly accentuated second sound, which is immediately followed by a soft, blowing diastolic murmur. This diastolic murmur ceases to be audible at a distance of two inches and one-third from the left edge of the sternum along the second interspace. Descending from the third rib at one inch from the sternum, this diastolic murmur continues audible till about the middle of the fourth rib, after which it ceases to be heard, the presystolic and systolic murmurs being alone audible beneath this point. Over the sternum this diastolic murmur is only to be heard between the second interspace and the fourth rib. The systolic murmur is slightly propagated into the carotid arteries, as is also the aortic second sound which remains pure. During the progress of the case the ventricular systolic sound over the apex was frequently found absent, and the diastolic murmur at the base became more limited in its area. The patient was discharged improved on 12th August.

The murmurs in these two interesting cases differ considerably in some respects, and yet, if we analyze them, both cases will be found to belong to the same category—examples of which, though not very common, are yet by no means rare. And I shall first remark, that the systolic basic murmur on the right or aortic side of the sternum, in the second case, very probably depended on a similar roughened condition of the under side of the aortic semilunar valves, which was observed in Macmurray; that the murmur was not distinctly heard in her case (the first sound in that position was only muffled) is no proof to the contrary, as these anomalies constantly happen, but, on the other hand, it is also possible that it may have been propagated from the left side, in which case it belongs to quite a different category; at the same time, had this been its only source, it would scarcely have been propagated so distinctly into both carotids, at least we should not expect it to have been so. The first point having a direct bearing on the subject in hand—the diagnosis of mitral stenosis—is the occurrence in both of these cases of a diastolic murmur, loudest at the right edge of the sternum at the base of the heart. In H.'s case there could be no doubt as to the diastolic character of the soft blowing murmur; in Macmurray's case, her ordinary pulse of 104 was reduced by digitalis and the recumbent posture to 80 before I could positively satisfy myself that her musical murmur was truly diastolic.

The region of the pulmonary artery to which these murmurs belong, has been not inaptly termed the region of romance, because of the murmurs audible there, which have given rise to much speculation, and which nevertheless seem easily explicable. Laennec, it is well known, taught that the second sound was due to the contraction of the auricles; and Hope, though well aware of the production of the second sound by the closure of the semilunar valves, yet taught that "when the mitral valve is contracted, a murmur accompanies, and sometimes entirely supersedes, the second sound," the influence of Laennec's teaching helping no doubt to mar the excellence of his own observation. For the murmur of mitral stenosis never obscures the second sound, though it often, as in the cases just described, immediately follows it; sometimes, as in them, separated by an appreciable interval from the true presystolic murmur (fig. 3), at others including it and running right through the periods of diastole and rest up to the apex beat (fig. 2). In both classes the first portion of the murmur is distinctly soft and diastolic in character, while the latter portion has a rough and systolic character, the direction of the current of blood being the same during both, clearly showing the influence of muscular propulsion in roughening the murmur. In Macmurray's case there is positive proof that the condition of the pulmonary valves had nothing to do with the production of diastolic murmur; the absence of any symptoms of disease of the right heart, in the other case, coupled with the great rarity of disease of the pulmonary artery, and the comparative frequency of similar diastolic murmurs in other cases of mitral stenosis, make it most probable that this diastolic murmur in all of them depends upon the same cause. The appreciable interval which existed between the diastolic and presystolic murmurs, in both cases, makes it impossible that prolonged auricular contraction, encroaching on the periods of rest and ventricular diastole, could have been the cause of these diastolic murmurs; for, in the face of a continuously contracting auricle, no theory of the production of these murmurs could account for a soundless interval interposed between a soft and a rough bruit, though it might explain the gradual roughening of the bruit towards its close. On the contrary, if we suppose two different causes acting in different directions to be at work in the production of these bruits, we have an efficient explanation of the difference in their character; and if we further suppose these causes to be separated by an interval, in the normal condition of the heart, we have also an efficient explanation of the pause which is occasionally interposed between the soft and the rough bruit, and we can also perceive a very plausible reason for the occasional absence of this pause. For it must be evident, that the more nearly the mechanism of the heart approaches the normal, so much the more closely will the physiological phenomena approximate those in health. The presence or absence of an appreciable pause in anormal conditions will therefore be a measure of the amount of anormality existing—a measure of the obstacle to the onward flow of the blood, of the degree of contraction present.

If we take an india-rubber bag-syringe, and, after emptying it of air, insert its nozzle into water, it will be found to fill with a rapidity proportioned to the size of the opening in its nozzle, into which, if any particle of dirt get, the bag either fills more slowly, or, if the opening be quite stopped, it ceases to fill or to dilate at all. So it is with the heart; in the normal condition of the auriculo-ventricular valves the diastole is completed at once—the blood not so much flowing freely into the ventricles, as closely following in a liquid mass the recession of their walls, for of course there is in the heart no vacuous cavity or air-filled space into which the blood can be, strictly speaking, said to flow. During the period of rest, the blood continues to pass into the heart, till the auricles, becoming stimulated by the distention, contract upon their contents, which they force into the already full ventricles—thus supplying to them that stimulus of distention necessary to induce their contraction in its turn; and the comparative tenuity of the auricular walls exists probably quite as much because of the necessity there is that the cardiac contraction should commence there, as because of the auricles having less work to do. When, however, from any cause the auriculo-ventricular opening is narrowed, it is certain that the diastole must be prolonged, and this prolongation of the diastole must increase according to the amount of mitral stenosis present, until it not only encroaches on the period of rest, but may even occupy the whole of it, the ventricle filling so slowly that the stimulus of distention is felt by the auricle before the ventricular diastole is perfectly concluded. Under these circumstances, if the right cavities be relatively proportional, even though not quite normal, and the mitral stenosis considerable, the stimulus of distention may be more speedily produced on the right side than the left, and as the result of that we have a want of synchronism in their action, and a consequent want of synchronism in the closure of the aortic and pulmonary semilunar valves, and hence reduplication of the second sound—a phenomenon of such frequent occurrence in the history of mitral stenosis as to be of considerable importance in the diagnosis of obscure cases, being in many of these a tolerably permanent and by no means a casual or unfrequent occurrence. The flow of blood through the contracted valve in such cases of prolonged diastole may be altogether soundless, or it may be accompanied by a murmur which may be musical, as in Macmurray's case, or non-musical, as in H.'s case, but in all it is of a soft, blowing, diastolic character, and presents none of the roughness of the auriculo-systolic murmur, in which it not unfrequently terminates, and this notwithstanding that both are equally direct murmurs so far as the current of the blood is concerned. It seems probable that the musical character of the murmur in Macmurray's case was produced by the vibrations of the rough, stumpy vegetation covering the upper surface of the aortic segment of the mitral valve; it seems equally probable, however, that in many cases a distinctly humming, though perhaps less distinctly musical, character may be given to the murmur merely by the peculiar state of tension of the valve itself.

You will observe that, as in the normal condition of the heart there is a pause between the ventricular diastole and the auricular systole, so, the more closely the diseased heart approaches to the normal one, the more likely we are to have a pause between the diastolic and auriculo-systolic murmur, while the absence of any pause is, according to the view now taken, only a proof of the great amount of stenosis present; and you will observe that Macmurray's heart bears out this view, inasmuch as the pause was distinctly marked in her, while the opening in the mitral valve actually admitted two fingers, which indicates a by no means great amount of contraction. You will also observe, that this explanation of the production of a prolonged presystolic murmur is not only consistent with what we know of the physiological action of the heart, but also with the character of the sounds heard, while it also does away with all the difficulties in the way of explaining reduplication of the second sound, as also those still greater difficulties of explaining how or when an auricle is to be filled, if we imagine that a bruit, occupying as it frequently does the whole of the diastole and rest, is produced by continuous auricular contraction.[1]

Bruits such as these may be graphically represented by the second and third illustrations in diagram 1, the first exhibiting them when they are continuous, the second when, as in the two related, they are not, part of the shading to the right of the centre being omitted to represent the pause. Phonetically they may be vocalized by *rrrrrb*, or, when softer and more musical, by *roo-oo-oo-oo-b*, and when we have reduplication of the second sound by *roo-oo-oo-oob-ta-ta*.

The systolic bruit audible in the pulmonary region has nothing to do with mitral stenosis; in the cases related it partly depended on mitral regurgitation, but it is also heard where no regurgitation is present. I shall describe its mechanism in both of these instances on another occasion.

It is very well known that a constricted mitral valve is not always diaphragmatic in character, but is occasionally funnel-shaped, the opening being at the apex of the cone which dips into the ventricle. I have no dissections of such cases to relate, but have occasionally had cases which presented characteristics which I conceived to be due to this form of valve—these are prolongations of the murmur, followed by a loud and accentuated first sound. It is such cases which are so apt to be mistaken at first hearing for a systolic murmur with an accentuated second sound; a reference to the carotid pulse at once corrects this misconception. The murmur in this case is aptly vocalized by the sounds *roo-oo-oo-lúp*, and the perfect closure of the valve has seemed to me readily explicable by the ease with which the sides of a long and somewhat loose valve, with a small opening, may be collapsed one upon the other.

Such, then, are the murmurs specially distinctive of mitral stenosis; I shall subsequently take up the physical signs diagnostic of this affection when no murmur, or when only a systolic one, is present. The mere addition of an apex systolic murmur to those described as distinctive of mitral stenosis in no way affects the diagnosis, and its consideration is therefore for the present omitted.

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[1] Macmurray's case has already been commented on in relation to the diagnosis of substernal aneurism, at p. 709 of this Journal for Feb. 1871. The occasional absence of the presystolic portion of the murmur in her case, gives it a very striking resemblance to that of Harriet H. (case 67), in Dr Hilton Fagge's interesting paper on the Murmurs attendant on Mitral Contraction, at p. 326 of Guy's Hospital Reports, vol. xvi. 1871.

(*To be continued.*)

Part Second.

REVIEWS.

The Action of Neurotic Medicines in Insanity. By T. S. CLOUSTON, M.D., Medical Superintendent of the Cumberland and Westmoreland Asylum, Carlisle. The Fothergillian Prize Essay for 1870. London: 1871.

AN accusation has been made against medical superintendents of asylums that they are not doing the amount of scientific work which might be expected from them, and that they are becoming mere administrators, stewards, and secretaries to the large establishments over which they preside. We have an uneasy feeling that this accusation contains a certain amount of truth. There is no doubt that it is safer for a medical superintendent to neglect his medical duties than any other of his multifarious avocations. Let him be mighty in small details, keep his accounts and registers in good order, not ask too much from the District Board, nor have too little furniture and fittings for the General Board of Lunacy, and he is at least out of the range of censure. There is much to draw him away from pathology and medicine, and little to bring him back to them.

Much good is done and much care lavished in a quiet, unobtrusive way by those in charge of such establishments, but this is not readily appreciated by the public; and it is therefore not without satisfaction that we point to the essay under review, as well as the able volume of West Riding Reports, edited by Dr J. H. Browne, as proofs that medical superintendents of asylums are still adding something to our knowledge of the treatment and pathology of nervous diseases.

If further evidence were needed, Dr Clouston's experiments fairly prove the prejudicial effect of opium in most forms of insanity. It was found to diminish the appetite, to lower the pulse, and to cause the patients to fall in weight, while it only allayed the excitement when given in large doses, and soon lost its effect. Nevertheless, it seems to us that people nowadays are rather too fond of accusing medicines of taking away their appetite. In our own experience, hyoscyamus has no such effect, though Dr Clouston assumes the contrary.

"It was one of the effects," writes Dr Clouston, "of Indian hemp, specially mentioned by O'Shaughnessy in his first experiment with the drug, that it caused an increase of appetite; and I found that when giving the bromide of potassium to my epileptic patients, it increased their appetites. Certainly no sedative or narcotine drug that I have ever used in large doses in the case of maniacal patients affected their appetites so little as the two given together. In doses under a drachm of each, I never saw any diminution of appetite at all, and in large doses it was only after a long time that I found the appetite sometimes lessened."

The most remarkable observation made by Dr Clouston in this essay may be stated in his own words, p. 35 :—

"3. A mixture of one drachm of bromide of potassium, with one drachm of the tincture of cannabis Indica, is more powerful to allay such excitement than any of the other drugs or stimulants tried. It is more uniform and certain in its effects, more lasting, interferes less with the appetite; and to produce the same effect the dose does not require to be increased after long-continued use."

"6. Bromide of potassium alone can subdue the most violent maniacal excitement, but only when given in immense and dangerous quantities; and its effects are so cumulative while so given, that after they have once begun to appear, they increase for days after the medicine has been stopped, almost paralyzing the cerebrum and sympathetic."

"7. To produce sleep in mild excitement, one drachm of the bromide of potassium is about equal to half a drachm of laudanum. To allay maniacal excitement, forty-five grains of the bromide and forty-five minims of the tincture cannabis are rather more than equivalent to a drachm of laudanum."

It must be remembered that the physiological action of bromide of potassium and Indian hemp are not the same; that bromide of potassium, according to Laborde, acts primarily on the spinal cord and sympathetic ganglia, and causes sleep by shutting out external impressions. Cannabis, on the other hand, acts at once upon the brain, and, being a diuretic, may help to prevent bromide of potassium accumulating in the system. Thus, when given together, these two drugs have a sedative action upon the whole nervous system. Dr Clouston found that as a rule the two drugs could be administered in the combined form for months at a time without the patients losing the appetite or falling off in weight. We have ourselves tried his prescription of one drachm of bromide of potassium and one drachm of tincture of hemp in several cases of acute and periodical mania with satisfactory results. According to Dr Clouston, it did not seem to do for melancholia—a form of mental derangement which in the acute form is sometimes relieved by chloral, and in the subacute form by opium. The question how far sedative drugs should be used in insanity is too wide a one for our present space.

We do not think it necessary to detail the manner in which Dr Clouston's experiments were made, farther than that the patients were cases in his own asylum, their diet and manner of living under his complete control; the medicines were given with regularity, and their effects noted with scientific precision. We have no objection to make to the rationale of his experiments, except that we are surprised at his assumption that beef-tea is "the most concentrated and nourishing of food." To use Dr E. Smith's remark upon the dietetic value of extract of beef, "No *combination* of nutritive elements can be offered to the body in a form more concentrated than its own flesh, and the flesh of animals is almost identical with our own." But no one affirms that hot water takes up all the nutritive material of beef as it takes up the useful principle of tea. The name beef-tea seems to mislead doctors as well as patients.

In conclusion, we have only to add that we hope Dr Clouston will not cease to prosecute his able, interesting, and useful observations.

A Batch of Pamphlets on Lunacy.

THOSE members of the profession who have devoted themselves to the study of insanity cannot be accused of wasting the opportunities which their duties have imposed upon them of communicating their opinions to the public. Being by their rules required to furnish reports of the asylums under their charge, they generally improve the occasion by ventilating the conclusions at which they have arrived in the study of those subjects, medical and otherwise, to which they have devoted special attention. Whether the law is a good one or not we do not stop to inquire; but certain it is, that there is evidence before us that many of the reports now lying on our table would never have been written at all had it not been for stern necessity.

A clergyman with whom we are acquainted, when condoled with for having to produce a couple of sermons a week, whether he had anything to say or not, confessed honestly to having once made one sermon serve three times, before the same congregation, in about the same number of months, by the simple expedient of changing the text. But in the case of the asylum physician the text must be always the same; and, accordingly, it is little wonder if, of the reports before us, amounting in number to some thirty or forty, only half-a-dozen or so are worth reading. Of the rest, suffice it to say that they are quite uninteresting. Some of them are, we are sorry to say, barely grammatical; others engage in long-winded remarks on subjects hardly worthy the attention of intelligent men; not a few—recognising the fact, we presume, that they are ostensibly addressed to the managing body of the asylum, which is not composed of medical men—indulge in popular writing, and dwell with infinite pleasure on the relation of the delusions under which a few of their patients labour. In all these there is little or no attention given to the treatment of insanity, to its pathology, its social aspects, or to anything else which can be, by any stretch of language, termed a scientific *résumé* of the subject. Of this we have a right to complain. During the last twenty years and more the nation has gone to enormous expense in providing suitable accommodation and appliances for the treatment and the proper study of the insane; but, judging by the documents before us, the results have been *nil.*

These are disagreeable and discouraging reflections. It is pleasant to turn, then, to the few notable exceptions, in which we recognise evidences of thoughtful, conscientious work, of labours for the most part of love, of zeal in the prosecution of uphill tasks, and of energy in the discussion of intricate inquiries. In the Report of the Royal Edinburgh Asylum for 1870, Dr Skae gives us, in that clear Saxon-English of which he is so perfect a master, an admirable digest of the progress of his asylum during the past year; and, if we have anything to complain of at all, it is that he seems to have studiously avoided all mention of drugs as agents in the treatment of insanity. In this indeed we can hardly blame him, as he is probably of opinion that the therapeutical treatment is at the best in an imperfect and transition state, and he may fear to give any drug the possibly undue pre-eminence which would attach to it were he to pronounce too decidedly in its favour. At the same time, a short account of his experience during the past year could not have failed to be interesting, while the record even of his failures would have added a valuable chapter to the history of the subject, and might have been the best guide to ultimate success. Taken as a whole, however, his report is a model of style, and its reticence on this and other subjects makes us only regret that its author has had no leisure during his busy, anxious life to raise a more lasting monument to himself in medical literature.

After the master comes the pupil, and in the Report of the Cumberland and Westmoreland Asylum, by Dr Clouston, we recognise much that is due to the influence of Dr Skae. On the other hand, Dr Clouston launches more boldly into the subject of the treatment, medical, moral, and legal, of insanity, and he has added a most interesting feature to his Report in the shape of a clinical history of several cases under his care during the year. This is a plan which might advantageously be adopted by others, as it is of much more practical value than any formal description of cases. The most interesting case, from a practical point of view, is one in which he procured sleep for a general paralytic by large doses of the hydrate of chloral. If this remedy is indeed one which may be given with safety in general paralysis, it will be an inestimable boon. There is no class of cases in asylum practice which are more troublesome, and which more thoroughly master the physician, than those of general paralysis with mania. Bromide of potassium is very uncertain, while opium is, in our experience, little else than a direct and speedy poison. We hope that Dr Clouston will publish some more of the results of the trial of this drug in general paralysis. Before we leave him, we must warn him against a slight tendency to slipshod writing, which may, if unchecked, become more palpable in future. The word "don't" is hardly legitimate in anything except familiar conversation.

In his Report of the Criminal Asylum at Broadmoor, Dr Orange makes some remarks on the advisableness of permitting those lunatics who have become insane during their imprisonment to be transferred to their own county asylums, where they would be within reach of their friends. This is a question which has vexed the minds of those concerned in the care of the insane, and will probably never be satisfactorily settled. Dr Orange advocates it only in the case of those who have become insane after being committed to jail for offences, and in those only after the term of sentence has expired, they being detained in Broadmoor until that time. This may be viewed in two lights. If danger to the public is all that is apprehended, two very satisfactory answers may be given: first, that all the criminal insane are not necessarily dangerous; and secondly, that in the county and district asylums there are patients quite as dangerous as any to be found in Broadmoor. But the more important question is, that it is unfair and detrimental to the present inhabitants of the public asylums that they should be forced to live in the company of criminals. It must be remembered that they are there whether they like it or not, and cannot choose their own associates. If, as appears from the context, Dr Orange's only reason for advocating the system is to relieve the crowded state of the Broadmoor Asylum, the true solution of the difficulty is to be found in building another. At the conclusion of the Report are elaborate tables of the post-mortem appearances in those who have died during the year, autopsies being held in all cases. Amid much that is interesting, there is a looseness of style in the wording of the tables which renders them in a great measure unfit for scientific reference. When adjectives such as "pale," "thick," "hard," "soft," etc., are used, the narrator ought to start with a given standard, that we may judge for ourselves of the importance of them as evidences of certain pathological conditions. For instance, in a post-mortem examination made forty-two hours after death, on the 16th July, Dr Orange talks of the cerebellum as being "too soft to be easily handled," and the "pons and medulla not so firm as usually" (*sic*). Does he mean that the want of firmness is unusual as compared with healthy viscera, or with viscera examined forty-two hours after death in the middle of July? This plan is still more perplexing when applied to measurements. When he talks of the choroid plexus (whether of one or more we know not) as being "narrow," we were somewhat surprised, as we were unaware that it was given to being anything else; but when he goes on to remark, "cornua developed," we are taken altogether aback. We did not know before that the cornua were usually undeveloped; and it appears that he has placed us, and all whom it may concern, on the horns of a dilemma. But these are faults easy of amendment, and we hope that Dr Orange will see with us that the information which he means to give is totally obscured by the way in which it is conveyed.

As we have several other pamphlets to notice, we shall say no more of the annual reports, merely pausing in conclusion to congratulate one medical superintendent on having secured an "interminible supply" of water; to condole with another on an outbreak of dissentery; to agree with a third that the "*frequency*, even of minor accidents, *tend* to augment" his "care" and anxiety; and to mention that a fourth thinks that there are "insuparable" objections to night-watching in his asylum, on account of its structural arrangements.

In a short paper, read before the Medico-Psychological Association, Dr Sibbald has given good reasons for the institution of a system of clinical instruction in insanity in the medical schools. He gives examples of the, if not ignorance, at any rate want of proper knowledge, of the subject in the medical man at the time of his setting up in practice, and advocates the establishment of wards in infirmaries, etc., for the treatment of insanity under the eye of the student. Of the first proposition—the general ignorance of medical practitioners—there is of course no doubt. We once saw a medical certificate, in which a young woman was certified to be insane solely because she was of opinion that her master's son wished to have connexion with her—a delusion which might have admitted of a little sifting. But of the expediency of devoting wards in an infirmary to the treatment of insanity, we are not so sure. Setting apart the important question whether lunatics could be suitably treated in such a place, especially with regard to exercising a proper control over their liberty, there still remains the consideration that insanity, although it may be due to the morbid condition of certain organs, like other diseases, is in one respect at least different from other diseases, namely, that in it the patient is not only as a rule convinced that he is quite well, but wishes also to impress upon the physician that he is so. It is questionable, therefore, if a true diagnosis could be arrived at in the presence of a class of students.

Dr Lockhart Robertson has again attacked the subject of the "Alleged Increase of Lunacy," in a paper which has been reprinted from the Journal of the Medico-Psychological Association. He says he still adheres to the statement which he made in a former paper on the subject, *that the alleged increase of lunacy is a popular fallacy, unsupported by recent statistics.* His paper consists so largely of quotations that it is not easy to follow the thread of his discourse; but we must say, that so far as we have been able to do so, we are not, while having no decided opinions on the subject ourselves, altogether convinced by his reasoning. The result of experience tends to the conclusion that we are not so healthy a race as we once were. Any dentist will tell you that the diseases which it is his special function to treat are largely on the increase, and there can be no question that the habits of the present day, the heavy tasks in which we engage, and the want of proper relaxation, the manner of living, the forenoon glass of sherry, or even of spirits, the afternoon tea, the late, heavy dinners, the hurried breakfasts, must promote the increase of ill health, and why not of insanity? Statistics covering a few years are of little value in these questions, for they can be made to prove anything Dr Robertson permits himself a loophole by quoting, evidently with acquiescence in his opinions, the words of a French writer—"I exclude from this hopeful view of the yearly decrease rather than increase of mental disease the insanity resulting from alcoholic abuse." If Dr Robertson means to accept this reservation—and from the way in which the passage is introduced we think ourselves justified in supposing that he does—he simply begs the whole question. If he removes one cause of insanity, why not any other, or them all? By such means he might prove that the disease had disappeared altogether.

Dr Howden, of Montrose, is so well known to the profession as the author of thoughtful papers and annual reports, that it is with special pleasure we notice anything coming from his pen. In "An Analysis of the Post-Mortem Appearances in 235 Insane Persons," he gives us some very interesting information. He makes one statement which should, we think, be carefully investigated by himself and others who attend to the pathology of the brain, that "the extent and manner in which the intellect is affected by cranial tumours depends altogether on their position. Central tumours of large size may coexist with an almost unimpaired mind; but wherever they involve or press on the convolutions, the patient presents symptoms of mental alienation." This is a most important observation, and should be inquired into.

Archives of Ophthalmology and Otology. London: William Wood & Co. New York: Trübner & Co.

We are in receipt of the first three numbers of this new periodical. It is edited by Professor Knapp of New York, and Professor Moos of Heidelberg, and is devoted to the advancement of ophthalmic and aural surgery. The plan of publication is different from that of any other journal, as it is produced simultaneously at New York and Carlsruhe in the English and German languages. The editors desire to issue the Archives in half-yearly numbers, each to contain from 250 to 300 pages, two numbers to form a volume.

Besides the able and energetic editors, we observe among the list of authors of original communications such well-known names as Liebreich, and Hinton of London, Wecker of Paris, Williams of Boston, Pagenstecher of Wiesbaden, etc. etc., which serves to indicate the position the journal is intended to occupy. We owe much of our advance both in ophthalmology and otology to the scientific labours of our German confrères; and of late extensive and able investigations into these subjects have been conducted by our Transatlantic brethren. A journal, therefore, in which the writings of both are contained is well worthy of the support of all in this country interested in these branches of medicine.

A Chemical Method of Treating the Excreta of Towns. By EDWARD C. C. STANFORD, F.C.S. London: 1869. Reprinted from the "Chemical News."

The Sewage Question. By EDWARD C. C. STANFORD. 1871. Reprinted from the "Chemical News."

IN the number of Virchow's *Archiv für Pathologische Anatomie*, etc., for August last, there is an elaborate comparison of the mortality in Copenhagen before and after the introduction of a new supply of water in July 1859, carried down to 1867. In the course of this the author, Dr Hornemann, shows how greatly the mortality and general severity of typhoid fever have decreased by the introduction of water-closets and a purer supply of drinking-water; and those who are acquainted with the foul-smelling "abtritts," and nearly as foul drinking-water so often found in Continental cities, will not wonder at this. But he adds, that no one will credit a better supply of water with any improvement which may be found in the mortality of such diseases as spread by epidemic contagion, such as measles and hooping-cough, adding to these diphtheria, with this footnote, "Diese Krankheit zumal ist neu." This disease, in particular, is of recent introduction. Now, it is somewhat remarkable that this special disease, which Hornemann remarks as in a manner coming in with the water to Copenhagen, though not unknown in former ages in this country, has not decreased with our improved water-supply—that, in fact, the two best drained towns in Scotland, Edinburgh and Glasgow, have of late suffered most severely from it: in the former, it has especially prevailed in the best parts of the town, where the drainage ought to be perfect, and want of water has been comparatively unknown; while its prevalence in Glasgow clearly proves that the most abundant water-supply is impotent to prevent its outbreak or its spreading. These statements, of course, though apparently connecting diphtheria with drainage, do not, of course, prove it, but they tend to do so; and when we state that diphtheria is never conveyed by infection, though it may be inoculated—that it hangs by houses and apartments often for years, though never conveyed by fomites—that those affected by it have, in our experience, recovered so readily when removed from local influences, that we shall never again willingly treat this disease without premising this important preliminary—and, further, that in no case have the circumstances in which diphtheria has arisen been carefully investigated without disclosing the escape of sewage gases into the apartments occupied,—the conviction that there is some active relation between sewage gas and diphtheria is strongly forced upon the mind. Of course we are aware that diphtheria prevails occasionally where there are, it may be, no drains, but not, in our experience, ever where there is no sewage or no sewage gases—that is to say, where there is an entire absence of the solid or gaseous material which ought to be conveyed by drains if they were present. And when we speak of diphtheria, we take it, not by itself, but as a type of low disease produced by foul gaseous emanations, of which there are many other varieties, ranging from mere depression of the health upwards.

When a town is well drained and amply supplied with water, we might be supposed to be placed beyond this danger so far as the art of man can do; but this is a mistake. If the works have been efficiently carried out the danger may be comparatively lessened, but never entirely removed; while, if they have not been efficiently constructed at one or more points, the danger is thus increased tenfold.

If we suppose the main drains of a town to open free on the banks of a river, even then only a small amount of the sewage gases escapes by diffusion; the current of the fluid contents of the drains is downwards, but the current of their gaseous contents is upwards, where they collect with a gradually increasing pressure beneath each water-trap, escaping with force into the house at each disturbance of the trap, and even at the best rapidly saturating the few inches of water in the trap, and then flowing out as rapidly from its upper surface as if the pipe were wholly empty—an outflow which is increased by atmospheric pressure whenever the wind blows from such a quarter as to impinge upon the open mouths of the drains. Of course where the drains open into the sea, the trapping by many tons of water at one end does not increase the safety of the houses at the other, protected by only a few inches of water—the result being that, in any well-drained city, all the sewage gases of necessity escape through the houses and poison the inhabitants, unless they are otherwise and unusually protected.

But in the best-drained cities two causes are at work to increase the danger: the first is careless workmen, and the second chemical agency. Even in the best houses of the best-drained city we have no guarantee that the work of draining is effectually done—the pipes of the house may be disconnected with those of the street by many inches; the luting may be of clay instead of cement, which, of course, speedily cracks off; or bath drip-pipes may be left untrapped. And these are not supposititious instances, but actual realities, which have been found in connexion with houses on whose construction no expense was spared. Further, the sewage gases corrode the lead of the soil-pipes, and thus pour into the houses by innumerable, almost microscopic, pores; and this is a source of danger of by no means unfrequent occurrence. And besides this, with a cistern supply, we have the waste-pipe of the cistern often untrapped, and, even if trapped, still a source of danger, contaminating not only the air of the house, but even its water-supply.

To protect ourselves and our families thus from dangers which are only too real, we must have efficient control and inspection of the construction of the drains; we must have ventilation of the sewers, and a two-inch pipe below each water-trap carried to the highest chimney of each house; and we must also have a constant water-supply.

It is no doubt possible to have all these good things, provided we are willing to pay for them; the probable expense may be estimated when we mention that to provide a constant supply of water alone for Edinburgh, it was recently proposed to spend £500,000; and this sum, calculated by the promoters of the scheme, was certainly not too much, and was considered by many far too little; and yet it amounted to a first mortgage of £156 upon a house of £100 a year rental for water-supply alone, leaving all the other evils wholly untouched. If carried out, this scheme might have increased our comfort—if that consists in an abundant supply of water—but certainly would have added little if anything to our safety. We shall not attempt to estimate the amount necessary for that, but content ourselves with having shown probable reasons why water-supply should not certainly be reckoned a source of all good, and also why it is, under existing circumstances, actually a source of much evil. Especially is this the case in small towns and rural villages, the introduction into which of the present fashionable systems of water-closets, with defective water-supply, and underground and unflushed drains, is a source of unmitigated evil.

But this whole system of sewage, as at present constituted, is not only a standing menace to our lives, but even to our pockets, to an extent that is totally undreamed of, for by it we deprive our land of what its necessities require, and have to send our money to foreign parts for a substitute for that manure which we spend more money in sweeping into the sea—ofttimes, by the way, rendering our rivers nuisances instead of sources of health and pleasure, which they ought to be. The Israelites of old, when they went about their business, had each a paddle at the end of their weapon with which they covered up their *reliquiæ* and added to the fertility of the soil. Of course, to act thus in the paved streets of large cities is simply impossible; but it is matter for serious consideration if we could not in some other way restore to the soil those fertilizing ingredients which have been abstracted from it.

We in Edinburgh are familiar with one phase of this attempt, in which neighbouring proprietors, taking advantage of our exigencies and of their rights over flowing waters, have enriched themselves at our expense, without contributing anything to lighten the burdens or lessen the dangers to which we expose ourselves for their behalf. Nay, more, these proprietors not only appropriate our sewage without expense to themselves, but they even arrogate to themselves the right to prescribe the kind of sewage they shall have, and to proscribe all that shall render it unfit for their purposes; so that if each of us floods his drains with carbolic acid for our own safety, as we may think we have a right to do, the proprietors of the Roseburn and Craigentinny Meadows may interdict the procedure and compel us to run all risks rather than that they shall lose their profits. Yet the example of Edinburgh in utilizing its sewage has been held up for imitation. With great pains we have got rid of the natural swamps around us, which produced only comparatively innocuous intermittent fevers, and have replaced them by artificial stinking meadows, which in their essence are productive of diseases tenfold more fatal. Is this an example to be imitated? We cannot indeed bottle up the contents of these sewers and send them into the sea; not only would this not lessen our danger, but it would expose us to an action for damages from the proprietors of these meadows; but we may do better—we may let the water flow, but, taking from it its fertilizing ingredients, sell them to all who may require them. The time is fast coming when this sewage question must be forced upon our attention—indeed the time has come when every thinking man ought, in the interests of humanity, to give his best thoughts to this question; and as a small but valuable contribution to the solution of the difficulty, we beg to refer to the pamphlets named at the head of this article, and also to an abstract paper on the same subject by the same author, read before the mechanical section of the British Association this autumn.

The system recommended by him is a modification of the earth-closet system, in which some form of carbon is substituted for earth. The main objections of the earth-closet to large towns are—the large amount of earth required, and the difficulty in obtaining the necessary supply.

"By the use of charcoal the amount of deodorizer required is reduced to less than a fourth as compared with earth, and by carbonizing the manure removed, a constant supply is secured.

"It is urged that the sewage difficulty may be enormously lessened, if not completely done away with, by treating the excreta of towns as we treat the ashes, removing each separately, and keeping all out of the public sewers. The quantity per head to be removed per annum may be fairly estimated at eight cwts., of which about seven cwts. represent urine alone. The amount of carbon required to perfectly absorb the whole of this quantity is less than eight cwts., so that in an ordinary household of ten persons, the total annual quantity required cannot exceed four tons, and the whole removal will probably, owing to the drying action of the charcoal, be about five to six tons.

"The same household would use about twenty tons of coals, and probably send away four tons of ashes; much of this coal would have to be carried into the bedrooms. The charcoal method is so perfectly inoffensive that commodes may be placed, if desired, in every bedroom, without the least fear of odour or of danger to health. In this respect no water-closet can compete with it. The carbon-closets are also arranged to be quite automatic, and require no attendance from within. The charcoal is introduced through an aperture in the roof into a reservoir at the top of the house; a closet on each floor draws on this source of supply, and the whole of the product is discharged in a dry deodorized state into a cemented vault in the basement story of the house.

"The chamber urine is emptied into a small earthenware urinal on each floor, and from this a lead pipe conducts it direct to the vault, where it is absorbed by the charcoal from the closets.

"The reservoir need only be replenished, and the vault emptied, once a year. The manure removed can scarcely be distinguished from cinders by an ordinary observer, and it is equally inoffensive.

"The value of the material removed is about 1s. per cwt., or 8s. per head per annum. The household has the charcoal and the material removed without cost. The manure is removed and carbonized in revolving retorts driven by a steam-engine; the whole of the material is then converted into charcoal; and gas liquor, tar, and gas are distilled off and collected in suitable condensers. The charcoal increases at each reburning by the amount yielded by the excreta itself, a portion is returned to go on charging the closets, and the balance is available as manure. The charcoal produced is an animal charcoal, resembling that made from bones, and contains all the phosphate and potash and soda salts of the excreta. The gas liquor furnishes ammonia derived from the animal portion of the food, and acetic acid derived from the vegetable portion. The tar and gas are used for heating purposes at the works. A new closet has been specially patented for the use of charcoal, by Messrs Pollock & Pollock, of Leeds, and may be obtained of the Carbon-Closet Co., 46 Haymount Street, Leeds. This closet, which is figured in 'The Engineer' of 5th August 1871, and which may be seen at 154 West Regent Street, Glasgow, is expressly constructed for the use of powdered charcoal; it delivers a minimum but accurately measured quantity, and places it exactly where it is required. When these come more into use the amount of charcoal will be much less than that alluded to in this notice; the quantity will, it is expected, be nearly one half the amount stated.

"For large public works the carbon-closet is invaluable; it is the only method of removal which the clumsiest of workmen cannot make offensive. The straw and waste with which the pipes of all workmen's water-closets are so constantly stopped do no harm here, and are all converted into charcoal on reburning. The principal shipbuilders on the Clyde are so impressed with these advantages, that they are pulling down large and extensive erections for water-closets to substitute carbon-closets. Urinals on this system are constructed simply of vertical slabs, six feet high and two feet wide, set in the form of a W, on a large stone flag, over a tank of charcoal; an occasional wash with a mop dipped in dilute hydrochloric acid will make the slabs instantly and perfectly clean. The acid is cheap, and it cannot injure either the urinal or the charcoal."

It is significant of the importance of this system that in Glasgow, the town best supplied with water in the whole world, a company has been formed for the purpose of carrying it out. We wish it good speed, and with all our heart we desire that Edinburgh too could be induced to give it a trial. Is it too much to hope that the Infirmary Managers will give this system due consideration? dare we hope that the new Infirmary shall set us a bright example in this as well as in other sanitary matters? We do hope, for we well know their anxious desire to do their best for their fellow-men; and any system which can not only provide for the proper co-relation between food and the manure necessary for the production of food, but also convert a curse into a blessing, and a continual source of expenditure into a source of profit from every point of view, cannot but have strong claims on the attention of all who desire to benefit mankind. Besides this, our civic rulers, who seem to have chiefly an eye to the main chance, ought to reflect that 8s. a head per annum on our present population of 250,000 amounts to £100,000 a year, which would yield the handsome interest of 10 per cent., even though the important sanitary arrangements necessary were to cost the double of what was to be expended in poisoning our houses and sweeping all this profit into the sea. And this, mark you, is not to be wrung from unwilling tax-payers, but gained in course of trade, and employed in relieving the city burdens—doing away with taxation. Surely a system which promises so fairly in every respect is worth a trial.

Pulmonary Consumption: its Nature, Varieties, and Treatment, with an Analysis of One Thousand Cases to exemplify its Duration. By C. J. B. WILLIAMS, M.D., F.R.S., etc.; and CHARLES THEODORE WILLIAMS, M.A., M.D. Oxon. London: Longmans, Green, and Co.: 1871. Pp. 402.

On Phthisis and the supposed Influence of Climate, etc. By WILLIAM THOMSON, L.R.C.S. Ed. Melbourne: Stillwell and Knight: 1870. Pp. 160.

Phthisis—Deaths from. Return ordered by the Legislative Council of Victoria, Nov. 1870.

Digest of the Return of all the Deaths from Phthisis ordered by the Legislative Council. By WILLIAM THOMSON, L.R.C.S. Ed. Melbourne: Stillwell and Knight: 1871.

pro R WILLIAMS, Sen., is a man who for forty years has probably
have t more of phthisis than any other man in Britain; for more than

fifty years he has been in the profession, for the practice of which he was prepared by the teaching of such masters as Alison, Laennec, Andral, and Chomel, and now he has given us the most valuable gift he could bestow, the record of his lifelong experience. We thank him most gratefully for the gift, as a further proof of his love to mankind, in whose service his life has been spent. It is, however, hardly a book to be criticised, at least within so short a space as could be assigned to it here; it is a work to be studied, and we can assure our readers that it will well repay a careful and studious perusal. It is a positive pleasure to read the introductory chapters, and mark the clear way in which he traces the pathology of tubercle from Laennec downwards, and points out that British views as to this pathology have not been so wanting in correctness as some have supposed; and, in particular, the interesting way in which he brings out, by direct quotation, that more than forty years ago (1824) Dr Abercrombie suggested and gave strong reasons for believing in the adenoid basis of tubercle—a theory which the researches of Wilson Fox and Burdon Sanderson have recently contributed greatly to revive and to place upon a surer basis. It is not want of individual ability that we in Britain have to complain of, it is the absence of the opportunities of practically inculcating the views thought out by noble minds. What a grand school might have been founded by the indefatigable Abercrombie, had he been placed at the head of a pathological institute like that of Berlin or Vienna!

In regard to the family predisposition and transmission of phthisis, the chapter on which has been written by Dr Theodore Williams, we find no reference to the very singular fact, that the tubercular as well as other diatheses may be transmitted from the male to the female—not simply by cohabitation, for this belongs to the same doubtful category as transmission by contagion—but through the medium of a fœtus; so that not only a mother may become thus tubercular, but even in such a way that children begotten by a healthy father out of an apparently healthy mother may inherit a diathesis thus acquired from a previous tubercular husband. This depends upon a peculiar but well-known law, by which the maternal organism becomes inoculated by the peculiarities of the paternal organism, through the influence of the fœtus in utero —a law which has been ably illustrated in a series of papers by Dr Alexander Harvey, of Aberdeen, in this Journal, during 1849–50 and in 1854, and which has been also practically illustrated in relation to this very disease by Dr Perroud, in his work "De la Tuberculose." Both Harvey and Perroud relate several such cases, and we should like to have heard Dr Williams's experience in this matter, as also in relation to the influence of a wet-nurse in modifying the constitution of a child in relation to tuberculosis.

The chapter on the Duration of Phthisis is deserving of a more careful analysis than we can find space for. Not only has an improved system of treatment contributed materially to prolong the lives of phthisical patients, but the improvements in the art of diagnosis have been such that many are now recognised as phthisical, whose cases would formerly either have altogether eluded observation, or would only have been recognised as phthisis at a more advanced stage of the disease; so that, apart from any curative agency, strictly so called, there are abundant reasons why phthisical patients should appear to live longer nowadays than they used to do. Of the 1000 patients whose cases are narrated, 198 are ascertained to have died, the average duration of the disease having been seven years and 8·72 months; while of the 802 patients who were alive when last heard of, the average duration of life has been eight years and 2·19 months—a somewhat higher duration than among the deaths, which were probably the worst cases, and one which Dr Williams considers likely to increase still further. As these cases were all amongst the better classes, the high average duration of life in these may be accepted as a further proof of the good to be obtained by a tonic—or what has been perhaps more correctly termed an analeptic—treatment. But there can be no doubt but that a strong infusion of ordinary hospital patients would rapidly reduce the average to something greatly nearer Laennec's mean of two years; while Portal's statement, that phthisical patients may live from ten days to forty years, is as true, but as indefinite as ever.

The chapters on Treatment are particularly instructive, Dr Williams entering into all the minutiæ of diet, climate, and habitation, as well as the more strictly medicinal modes of treatment, which he divides into antiphthisical and palliative; the great object of the former being to sustain the vitality of the bioplasm, and prevent its degeneration into phthinoplasm, which he regards as the essence of tubercle; and he makes the strong statement that cod-liver oil "has done more for the consumptive than all other means put together," while he regards its usefulness as still increasing. Dr Williams states, that in cases of peculiar weakness of stomach, with tendency to vomit, he has found the $\frac{1}{32}$ or $\frac{1}{24}$ of a grain of strychnia so efficacious in preventing this, when given along with the oil, that he has been led to regard strychnia as a specific against the retching of phthisis. He also speaks highly of the tonic powers of arsenic, especially in relation to nutrition and respiration, and states that he has found it most useful in chronic cases complicated with asthma, eczema, or psoriasis. In regard to hæmoptysis, Dr Williams says that his experience of ergot of rye has been most satisfactory; he has often tried it where other styptics had utterly failed, and with prompt and decided effects; the dose, he adds, should be not less than one drachm of the fluid extract, repeated for a few times. Might we suggest to him a trial of the subcutaneous injection of ergotine, as more rapid and energetic in its action, and in every way more applicable and useful in suitable cases? while in other cases more rare, where the blood oozes from the degenerated mucous membrane of the bronchi, the perchloride of iron, in the form of spray, seems often to be markedly efficacious. The chapters on Treatment we cordially recommend, and the whole work is altogether one of the most instructive we have ever had occasion to peruse, as it could hardly fail to be, when it contains the essence of the lifelong experience of such a man as Dr C. J. B. Williams.

Dr Thomson's work deals with phthisis from a specific point of view; we in Britain have been too much in the habit of almost regarding climate as a specific, or, at all events, as a special element in the cure of consumption, and of recommending the climate of Australia as one of those best adapted for this end, that it is very startling to be told, as we are at the very commencement of this work, that nearly 1 in 3 of the adult population of Melbourne, between the ages of 20 and 45, and above 1 in 4 at the same ages in the whole colony of Victoria, die of phthisis. This startling announcement was, by a unanimous vote of the Medical Society of Victoria, declared to be untrue; but the subject was very properly regarded of such importance that a parliamentary inquiry into the matter was ordered, and this was found fully to bear out Dr Thomson's statistics; 2143 persons having been found to have died from phthisis, in Melbourne and its suburbs, during a period of five and a half years, and out of a population of 170,000. 1 in 8 is the proportion of deaths from phthisis to that from all causes in England and Wales, 1 in 10 the similar ratio for Melbourne; but Dr Thomson shows that in the colony the deaths from phthisis are increasing with the population, till the ratio now equals and even probably exceeds that of the mother country. The author compares the statistics of death from phthisis throughout the general population in Victoria, America, Tasmania, Scotland, England, and the continent of Europe. He also considers the same topic in relation to various callings, such as the clerical, domestic servants, soldiers, factory girls, etc., making in each case authenticated statistics the basis of his reasonings, which inexorably lead to the conclusion that the Australian climate, in spite of its mild winter, sunny days, and balmy nights, has no "specific influence in preventing and controlling the development of pulmonary consumption;" and further, that statistics do not prove that the Australian climate is in any respect capable of preventing the development of that disease, or even of averting its progress. It is the old story over again. "I have seen," says Professor Casper, "the gravestones of Germans, English, French, and Russians in Rome and Naples, in the beautiful grave-yards of Marseilles, Pisa, Nice, and Malta, and bitter thoughts have crossed my mind as to the sad state of medical science, and the blasted hopes of hundreds of families." No doubt, however, in certain cases, change of climate is beneficial, warding off catarrhal complications and improving the general health; but, as a rule, it is not and cannot be of so much advantage as is often in ignorance ascribed to it. Galen sent his phthisical patients to sail up the Nile—"non propter se, sed propter longinquitatem navigandi." And too often it seems as if, even yet, the selection of a health resort were made for the same reason which that wily old physician knew so well to put correctly. In our advice to patients in regard to this matter, we must always take into consideration the state and stage of the disease, the temperament of the patient, and the probable deprivation of home comforts, any or all of which may operate so injuriously as to do away with any good results from mere change of climate. Amongst those elements to be duly considered, house comfort is no small item; and we who possess large airy rooms, and well-built, warm stone houses, ought to think twice before we remove our patients to the thin-walled, coldly-furnished, and less easily heated houses of more southern climates, the misery of which is poorly compensated for by a warm midday sun. In regard to these matters, Dr Williams's work also contains some very suitable advice.

Digitalis; its Mode of Action, and its Use. By J. MILNER FOTHERGILL, M.D. London: H. K. Lewis: 1871.

THIS essay, which obtained the Hastings Prize of the British Medical Association for 1870, has been already so fully noticed in our pages (*vide* our September number, p. 278), that we have only now to congratulate the author on its reappearance in this improved shape, and to express our hope that it will prove useful in directing greater attention to the therapeutic virtues of this valuable drug. This essay is one which should be in the library of every practitioner.

The Medical Practitioner's Legal Guide. By HUGH WEIGHTMAN, Esq., M.A. Cantab. London: H. Renshaw: 1870. Pp. 416.

A Manual of the Laws affecting Medical Men. By ROBERT GEORGE GLENN, LL.B. London: J. and A. Churchill: 1871. Pp. 460.

BOTH of these works contain a variety of interesting information in regard to the laws affecting medical men. The possession of neither, nor, for the matter of that, of both of them, will preclude the necessity for occasionally consulting a lawyer. In two cases we have consulted them, and found them both alike wanting. A man died of cancer of the bladder, after an illness of three years' duration, dying ultimately from uræmia, after being only a day or two confined to bed. After death he was adjudged a bankrupt. A claim for deathbed attendance is under these circumstances a preferable claim, and to be paid in full. Query, how much of that attendance is preferable? Neither Weightman nor Glenn give the slightest hint; yet this is a very important matter, and might involve a large sum.

Again, quite recently, a coroner ordered two medical men to make an examination of the person of a female suspected of having given birth to a child. The result was the suicide of the female. Query, how far is a coroner or procurator-fiscal justified in making such an order? Again these works give no reply.

Part Third.

PERISCOPE.

REPORT ON OPHTHALMOLOGY.

BY DR ARGYLL ROBERTSON.

PROFESSOR DONDERS ON THE SUPPORT OF THE EYES DURING EXPIRATORY BLOOD PRESSURE.

On the occasion of a recent visit to this country, Professor Donders had his attention directed by Darwin to a theory propounded by Sir Charles Bell in the second part of his paper of the Nerves of the Orbit, to the effect that the closure of the lids, which occurs during sneezing and coughing, is a provision to compress and support the vascular system of the eye, and to guard it against the violent rush of blood which attends these expiratory acts. Sir Charles Bell attributed the appearance of flashes of light before the eyes during the act of violent coughing or sneezing, not to the impulse of blood forced into the eye, but to the contraction of the eyelids to counteract the force of this impulse, and to guard the delicate texture of the eye. As proof of this, he stated that if the eyelids be held open during the act of sneezing, no sensation of light will be experienced. If, again, the eyelids of a child crying and struggling with passion be held open, the conjunctiva becomes suddenly injected, the support of the lids having been withdrawn.

As a result of investigations, Professor Donders was convinced that strong expiration induced a considerable increase in the pressure of blood in the *arteries*, but that this rapidly passed off. Experiments further showed that during expiration the jugular vein became distended with blood, and emptied during inspiration, and that this distention was not due to a regurgitation of blood from the thorax. Donders, therefore, concluded that the increased blood-pressure in the smaller vessels and capillaries during forced expiration was occasioned, 1*st*, by an increased flow towards these vessels; and, 2*d*, by a retarded circulation from them. Of these, the latter acts more slowly, and perhaps less strongly, but for a longer period than the former. The one acts by accelerating, the other by retarding, the current of the circulation. On examining how far these circumstances act on the circulation of the eye, Donders found by examining the living human eye with the microscope, that during expiration the superficial veins become increased in calibre, but that the superficial arteries undergo little change. Slight extravasations of blood into the conjunctiva from blows, sneezing, coughing, etc., are of common occurrence, and unattended with serious results, therefore the support of the eyelids does not appear to be of much importance to these vessels except as a means of checking the increase of extravasation. The deep vessels of the eye find support in the distented condition of the eyeball and the elasticity of its coats. In their case increased blood pressure does not threaten danger except by inducing excessive tension. The vessels can only be distended so far as increased space in the interior of the eye can be obtained. Dr Adamük's experiments have demonstrated that increased blood pressure is regularly followed by increased tension of the fluids of the eye, depending upon serous exudation, which is thus a new protection to the vessels of the eye. Donders found, from ophthalmoscopic examination of the human eye, that voluntary expiratory effort after deep inspiration induced a distention of the retinal veins. Pressure with the finger on the eye causes diminution in the calibre of the retinal veins, and Donders has convinced himself that the pressure of the lids can effect the same change. The lids, therefore, can and do support the intraocular bloodvessels during violent expiratory efforts.

That the orbital veins are distended during forcible expiration, Professor Donders considers probable from anatomical considerations, the flow of blood from the ophthalmic veins into the cavernous sinus being hindered by increased intracranial blood pressure. Careful measurements with the ophthalmometer also demonstrated a readily-recognisable protrusion of the eye forwards during continued and forcible expiration, which protrusion could only be accounted for by dilatation of the orbital veins. This dilatation Professor Donders believes may be checked by the pressure exerted by the closed lids. Another physiological circumstance originally observed by Müller was confirmed by these experiments, namely, that, in ordinary circumstances, the degree of protrusion of the eye varies according to the extent to which the eyelids are opened, and that during each act of winking the eyeball is pushed back into the socket by the pressure of the lids. The movement of the eye forwards when the eyelid is raised, is partly to be accounted for by the contraction of the levator muscle pushing the eye forwards. The eye was also found to be slightly projected from the orbit during the act of accommodation for a near object.

In conclusion, Professor Donders considers it still doubtful whether the closure of the lids during forced expiration is to be regarded as a protective act to support the circulation of the eye, or is to be viewed simply as one of many associated movements.—*Archiv für Ophth.*, band xvii. abth. i. p. 80.

ON THE LIMIT OF SENSIBILITY OF THE EYE FOR THE COLOURS OF THE SPECTRUM. BY S. LAMANSKY, HEIDELBERG.

By the advice of Professor Helmholtz, Mr Lamansky made his observations upon polarized light transmitted through the ordinary spectroscope. The resulting spectrum was viewed through calc-spar, when the two images thus obtained varied in brightness according to the angle at which the light struck the polarizing glass-plates. Taking one of the colours of the spectrum for observation, he then diminished the angle at which the light struck the glass-plates (by turning the plates round) until the two images appeared to the eye to be of the same brightness. The angle at which the glass-plates then stand, may be viewed as indicating the limit of sensibility of the eye for that colour. Each of the coloured rays was taken in succession, and accurate measurements of the angle made. The result of his observations was, that the eye was sensitive to the colours of the spectrum in the following order:—Green and yellow equal; blue, violet, orange, red; and that the sensitiveness of the eye for green and yellow is greater, and for violet, orange, and red less than for white light.—*Archiv für Ophth.*, band xvii. abth. i. p. 123.

DR EMIL EMMERT, BERN, ON BASEDOW'S DISEASE (EXOPHTHALMIC GOITRE).

Referring to the difference of opinion that still exists regarding the discoverer of this disease, the Germans claiming the credit for Basedow, the English for Graves, Dr Emmert points out that Basedow has the priority of publication, but that Graves independently arrived at similar conclusions, and published his observations three years later. Dr Emmert's attention was, however, directed by Mr Bader of Guy's Hospital, to a book entitled "Collections from the Unpublished Medical Writings of the late Caleb Hillier Parry, 1825," which contained a chapter on "Enlargement of the Thyroid Gland in connexion with Enlargement or Palpitation of the Heart."

Mr Parry narrates eight cases of the affection, and adds other five under the head of "Bronchocele, with Affections of the Head." The chief symptoms in the first eight cases were palpitation, strong pulsations in the carotid with weak radial pulsations, enlargement of the thyroid gland, a very quick, often intermittent pulse, and in one case exophthalmos. In the other five cases, besides the symptoms mentioned, epilepsy, deafness, headache, giddiness, and other nervous symptoms were present. Dr Emmert, with the view of directing attention to Mr Parry's observations, has reproduced these thirteen cases in his paper. We fail, however, to find any allusion to exophthalmos as a symptom in any of the cases.

Some of the thirteen related cases, says Dr Emmert, must, without doubt, be ranked as cases of Basedow's disease, and it only remains to determine whether we can classify them all as such, and whether Parry, whose first described case, and the one presenting most distinctly the symptoms of Basedow's disease, dates from the year 1786, had by the classification of these cases recognised a disease corresponding to that of Basedow.

Dr Emmert is of opinion that if this be decided in the affirmative, the affection should for the future be termed not Basedow's or Graves's, but Parry's disease.

During a seven months' residence in London, Dr Emmert had the opportunity of examining about twenty cases of this disease. 90 per cent. of the patients were women, chiefly from seventeen to thirty-five years of age. Palpitation was present in all the cases, as also strong pulsation in the carotids, with relatively weak radial pulsation; the pulse from 90 to 100 in the minute. The majority of the patients were pale and anæmic. Enlargement of the thyroid, though not a constant symptom, was present in most cases. In some it varied periodically in degree. In all there was exophthalmos. The author refers to one case in which there was exophthalmos of one eye only. In all the cases he found the movements of the eye somewhat restricted in all directions, and a diminished sensibility of the cornea and conjunctiva. In about six he noticed a peculiar form of defective speech. When patients so affected are about to speak, they open their mouths pretty wide, and the jaw moves in a spasmodic manner; and only after several attempts do they obtain command of speech. They then speak rapidly, and often somewhat indistinctly.—*Archiv für Ophth.*, band xvii. abth. i. p. 203.

REPORT ON THIRTY-EIGHT CASES OF PARALYSIS OF THE ACCOMMODATION. BY DR SCHEBY-BUCH, WURZBURG.

Of the thirty-eight cases, twenty-four were due to diphtheria (in twenty following diphtheria of the throat, in three diphtheria affecting wounds, in one diphtheria of vagina and skin), five were referable to sausage-poisoning, and the remainder were of more or less obscure causation (typhus, scrofula, alcohol, etc.).

In only one of the diphtheritic cases was there observed dilatation and sluggish action of the pupil, while this symptom was present in five out of thirteen of the other cases (in the fourteenth the state of the pupil was not noticed). As in only one of his diphtheritic cases the circular fibres of the iris (which are supplied by the same nerve as the ciliary muscle) were paralyzed, and as in that case, and also in similar cases related by others, the two paralytic affections did not run a parallel course, Dr Scheby-Buch thinks the paralytic affection cannot be referred to any disorder of the nerve-centres; and as the action of the Calabar bean on the accommodation and size of the pupil is not interfered with in these cases, the affection cannot be referred to the muscles themselves; hence the peripheral extremities of the nerves must be the seat of the disease.

In all the cases, a diminution in the refraction of the eye was observed, and in seven a decrease in the acuity of vision, which existed only during the occurrence of the paralysis.

In almost every case, the Calabar bean was employed along with tonics, and this treatment was attended with unequivocal good results.

The absence of the forward movement of the iris, when a near object is looked at, is referred to as a useful diagnostic symptom.—*Archiv für Ophth.*, band xvii. abth. i. p. 265.

ON THE USE OF THE CALABAR BEAN IN DIPHTHERITIC PARALYSIS OF THE ACCOMMODATION. BY PROF. MANZ, FREIBURG.

Prof. Manz noticed that the pupil was generally little affected in these cases. He found the employment of oft-repeated weak applications of the Calabar bean to effect more permanent benefit than stronger ones. The preparation he employed was Calabar bean paper. In two of the cases, the application of the Calabar bean to the one eye produced secondary contraction of the pupil of the other eye. [Might this result not be accounted for by the patient rubbing his eyes during the application of the paper, and conveying the tears containing the active principle of the Calabar bean to the other eye?—D. A. R.] Although the paralysis is one which naturally tends to recovery, the healing process is at any rate very much quickened by the use of the Calabar bean.—*Zehender's Monatsblätt. für Augenheilk.*, Sept. 1870.

CASE OF NEUROSIS OF THE OPTIC NERVE AND RETINA.

Dr Herman Pagenstecher, Wiesbaden, narrates the case of a girl, twelve years of age, who was brought to him for advice on account of rapid diminution of vision of four weeks' standing. For a year previously she had suffered from nervous symptoms—attacks of lameness, first of one leg, then the other, headaches, vomiting, etc., which always yielded to strychnia. On examination, vision was found very defective in both eyes: they were sensitive to bright light, and moderate darkening of the room improved the vision slightly; but the application of either a red or blue glass at once brought the vision almost to a normal standard. There was hyperæsthesia of the whole of the left side of the body, and pinching or striking any part of the left side induced reflex movements and appearance of bright spectra before the left eye. Blue-coloured glasses were ordered. Three days later the acuity of vision was found to be normal with blue glasses. The hyperæsthesia existed as before. The coloured spectra that appeared before the eye on pinching the left side of the head, were described by the patient as consisting of concentric rings—the outermost red, the innermost yellow, the intermediate black. Pressure over the back of the head and first three cervical vertebræ induced severe pain, and produced the brightest-coloured spectra. Pressure below the ninth dorsal vertebra on the left side produced merely the appearance of a red disc before the eye. During the next ten days the hyperæsthesia gradually diminished in degree, but was still markedly present at the end of that time. Dr W. Müller saw the case, and applied the constant galvanic current, with the following effect: On applying the copper pole to the back of the head and the spinous processes of the upper cervical vertebræ, while the zinc pole was held in her hand, the weakest current produced the coloured rings above described during the whole period of the passage of the current. Applied below the seventh cervical vertebra, only the red colour was produced; below the third dorsal vertebra, no spectrum was produced. On direct stimulation of the right optic nerve, by applying either the copper or zinc pole to the immediate neighbourhood of the eye, a yellow glimmer appeared on opening and closing the current, which however, was persistent when the current was applied to the left optic nerve; the same occurred on passing the current through the head. Irritation of the sympathetic, by applying one pole to the angle of the jaw, the other over the first cervical vertebra, induced a yellow colour. After stimulating the medulla for half a minute, all appearance of coloured spectra vanished, and they could not be reproduced by passing the current in any direction. During the course of the examination, the patient stated that the colours became less and less distinct, till yellow took the place of the other colours, and eventually it disappeared. The following day, pressure over the back of the head reproduced the colours as before. The constant stream, with the application of the copper pole over the medulla, was daily employed, and in the course of a few days the affection entirely disappeared.—*Zehender's Monatsblätt. für Augenheilk.*, Jan. 1871.

ON LEAD-POISONING AS A CAUSE OF OPTIC NEURITIS.

Mr Jonathan Hutchinson narrates five cases of defective vision occurring in patients affected with lead-poisoning, in all of whom the presence or previous existence of inflammation of the optic nerve was revealed on ophthalmoscopic examination. Numerous cases of this kind have been recorded in the German medical journals, but this form of amaurosis has attracted little attention in this country.—*Royal London Ophthalmic Hosp. Reports*, vol. vii. part i. p. 6.

FAILURE OF SIGHT DURING LACTATION.

Mr Hutchinson draws attention to the fact that dimness of vision during suckling may be merely an indication of the existence of hypermetropia, and not necessarily indicate retinal disease. Until weakened by lactation, many hypermetropic women experience no inconvenience, being able to bear the accommodative strain necessary to overcome the error of refraction; but during lactation they find it difficult to keep the ciliary muscle up to its unusual exertion. The use of tonics is indicated at the time, and it is well to examine as to whether spectacles are not requisite.—*Roy. Lond. Ophth. Hosp. Reports*, vol. vii. part i. p. 38.

THE EFFECTS OF THE APPLICATION OF A LEECH TO THE EYE. BY DR LEBRUN, BRUSSELS.

The patient, a man-servant, thirty-nine years of age, presented himself for advice on account of an eye affected with severe inflammation, intense photophobia, and excessive circumorbital pains. At the lower and outer border of the cornea a wound with three radiating arms was observed—in fact, a typical leech-bite—the pupil was displaced as after an iridesis, and there was a considerable collection of pus at the foot of the anterior chamber.

The patient stated that for some time the eye had suffered from lachrymation, sensitiveness to light, and slight pains, which symptoms had rather been aggravated than relieved by the collyria that had been ordered by his medical attendant. He had then himself conceived the idea of checking the inflammation by the abstraction of blood, and he had therefore applied a leech *loco dolenti*. The leech-bite penetrated the coats of the eye, allowing the aqueous humour to escape, and causing the displacement of the pupil. The iris and deeper textures of the eye had become intensely inflamed, but the lens retained its transparency. In spite of appropriate treatment, the deep inflammation persisted, the pupil became occluded, and the eye was becoming atrophied, when the patient left the institution, where he had been under observation. He was directed to return if the sight of the other eye became affected. Two months later he again presented himself with irritability and symptoms of the commencement of sympathetic ophthalmia of the other eye. The leeched eye was consequently removed without delay, and the irritable condition of the other eye rapidly subsided; but the patient declared that the sight was not so clear as it had originally been.—*Annales d'Oculistique*, tome lxiv. p. 136.

CASE OF ANOPHTHALMOS. BY DR PIETRO GRADENIGO, VENICE.

The subject of this malformation was a little girl, born of healthy parents, in whom the most careful examination failed to detect, beyond the complete absence of eyeballs, anything that indicated defective or arrested development. The eyelids were normal, fringed with eyelashes growing regularly, the puncta were permeable. In consequence of the absence of the globes, the lids were drawn into the socket, and their external surface concave and their edges directed inwards, while the palpebral fissures were a little shorter than usual. The eyelids were incapable of any movement, doubtless from the absence of the levator muscle, and the want of support. When the infant cried, some superficial wrinkling of the skin, due to the action of the orbicular muscle, may with difficulty be observed. There is little or no lachrymal secretion. On opening the lids a cavity was displayed of an ovoid or irregular pyramidal form, capable of holding a large cherry, and covered with a smooth rose-coloured membrane. No rudiments of eyeballs could be detected, nor anything to lead to the conclusion that the recti or oblique muscles or the levator palpebræ were present. Among the small number of cases of anophthalmos on record, one scarcely finds any that were not associated with other malformations.

The child came under observation in 1865, and died in 1868 of apoplexy. On post-mortem examination, the contents of the orbits between the mucous membrane and the periosteum were found to consist of fat and cellular tissue, in which well-developed muscles and nerves were found. The four recti, two centimètres in length, were inserted in a fibrous capsule, which seemed to represent the sclerotic. The levator palpebræ was divided into two portions, the one uniting with the superior rectus, the other portion on the one side separating the two parts of the lachrymal gland, on the other terminating in the trochlea of the superior oblique. The superior oblique was well developed, and normal in origin and course, except that its tendon was inserted in the belly of the rectus superior. The inferior oblique passed first to the fibrous capsule representing the eye, but then changing its direction it proceeded to the apex of the orbit, and its tendon was inserted at the edge of the optic foramen. The lachrymal apparatus was well developed, and there was no anomaly of the circulation, except that the long and short ciliary branches of the ophthalmic artery were absent. The optic nerves did not exist; the central portion and chiasma were also absent; the corpora quadrigemina were only rudimentary, and it was with difficulty that the corpora geniculata could be recognised. The ophthalmic ganglion did not exist, nor the nervous filaments which united in it. In other respects the nervous supply was regular. —*Annales d'Oculistique*, tome lxiv. pp. 174 and 263.

ON THE EFFECT OF CALABAR BEAN AND ATROPINE ON THE HUMAN EYE AFTER DEATH.

Borelli found that, if applied to the eye within six hours after death, these substances acted on the pupil as during life. In exceptional cases, effects followed their application so long as twenty-four hours after death. He found the result of their application less marked in cases where death had ensued from old age or marasmus. The length of time that had elapsed after death also influenced the result. A reflection of the myotic action of the Calabar bean from the one eye to the other was also noticed, which never was seen in the case of the mydriatic action of atropine. This difference Borelli attributes to the fact that the brain, which is the organ of reflex action for the circular fibres of the iris, preserves its vitality longer after death than the great sympathetic which innervates the radiating fibres.—*Annales d' Oculistique*, tome lxiv. p. 250 (extracted from *Giornale d' Oftalmologia Italiano*).

OBSERVATIONS ON THE CURE OF CATARACT BY PHOSPHURETTED OIL.

Prof. Gioppi of Padua reports six cases of cataract in which he had used phosphuretted oil. Four were cases of soft, the other two of ordinary senile cataract. The oil was applied for two weeks, in the form of drops to the eye, four to six times a day, as an inunction to the circumorbital region, and internally in the form of pills containing one milligramme, of which from two to four were taken daily. He did not observe any result local or general from this treatment, and no change in the lens.—*Annales d' Oculistique*, tome lxiv. p. 251 (extracted from *Giornale d' Oftalmologia Italiano*).

ON THE USE OF STRYCHNINE IN AMAUROSIS. BY PROF. NAGEL OF TUBINGEN.

For some years the author has been convinced that strychnine is a remedy of great importance, and incapable of being replaced in the treatment of amaurosis. Subcutaneous injection of small doses of the nitrate of strychnine was the method of administration employed. In cases of slight amblyopia, presenting the characters of paralysis of the retina, he often found not merely central but excentric vision improved. Commencing, or even tolerably advanced, atrophic degeneration of the optic disc is also ameliorated by the action of strychnine. Even in desperate cases, the progress of the disease is arrested, and one may even obtain improvement. In one amaurotic individual, the rapid progress of the disease was arrested, so that five days after the use of the strychnine he was able to decipher letters, notwithstandiug the glossy whiteness of the optic disc. In other cases the disc regains in part its red colour. The amblyopia caused by the want of use of an eye sometimes improves rapidly. Thus, an eye that could only count fingers at a few feet distance, after fourteen days' treatment could read small print (Jaeger, No. 3). Remarkable success several times followed in cases of amaurosis of traumatic origin, and also in cases of toxic amaurosis. Cases of cerebral and spinal amaurosis are least benefited by its use. Intraocular optic neuritis and its consequences are not modified by the employment of this remedy. Cerebral irritation and tabes (dorsalis) contraindicate its administration. The hydrate of chloral may be employed at the same time to allay the sleeplessness of amaurotics, or the secondary effects of strychnine, without interfering with its action on the eye.—*Annales d' Oculistique*, tome lxv. p. 76.

TWO CASES OF EXTRACTION OF A FOREIGN BODY FROM THE CORPUS VITREUM. BY DR R. BERLIN, STUTTGART.

The first case was that of a young woman serving in a shooting-gallery for air-guns, who was struck on her right eyebrow with the barrel of a charged gun, which at the same moment went off. Vomiting, diarrhœa, and short attacks of fainting and giddiness followed. She was seen twelve hours after the accident. There was no fever, and no retardation of pulse. The eyelids were extremely swollen. There was great chemosis of the conjunctiva. The cornea was gray and opaque, and lacerated by a wound branching in four directions. The eyeball was collapsed and soft, and all perception of light lost. In order to judge whether the air-gun had power to drive the ball into the brain, the gun was obtained and a shot fired against a deal door at a distance of four paces. The ball was thrown back by the soft wood, a superficial mark being alone left. The result of this experiment led Dr Berlin to conclude that the ball had not force enough to pass twice through the membranes of the eye, and also to penetrate the contents of the orbit and its walls. As all chance of restoring sight was lost, the interior of the eye was examined with a probe, and a hard smooth object was felt at the bottom of the eyeball, which, on being removed with forceps, proved to be the bullet. The inflammation gradually subsided, and the patient was dismissed in eighteen days with a shrunken eyeball.

The second case was that of a smith, who, while chiselling cast steel, received a blow on his right eye, which was followed by rapid obscuration of sight. When seen, four hours later, the conjunctiva was moderately inflamed; there was a perpendicular wound of the cornea, three lines in length, reaching to the sclerotic; the iris and lens were cut in the same direction as the cornea, and the lens was already opaque. On examining the visual power of the eye; it was found that the light of a candle was recognised at the distance of about six paces, but it was found that the upper half of the visual field was entirely wanting, indicating either that the inferior part of the retina did not perceive light, or that the rays of light were prevented reaching that part of the retina by some material obstacles. From a series of anatomical investigations on eyeballs extirpated soon after injuries, Dr Berlin concluded that the limitation of the field of vision depended on an extensive hæmorrhage into the vitreous humour. He is of opinion that limitation or absence of the upper part of the field of vision is an important diagnostic symptom of the presence of a foreign body in the eye; as when such a body is propelled through the coats of the eye it naturally sinks to the lower part of the vitreous humour, and any blood that may be effused occupies a similar position. The patient was received into hospital the following day. As the symptoms had increased in severity to such a degree as to indicate the commencement of a purulent inflammation of the inner coats of the eye, there was no hope of recovery of sight; but it was necessary, with the view of checking the inflammation and avoiding the chance of sympathetic ophthalmia of the other eye, either to extract the foreign body or enucleate the eye. The patient preferred the former operation, which was performed by making a linear incision at the lower part of the cornea, removing a portion of iris and the lens, probing for the foreign body in the vitreous chamber till it was felt, and then removing it with forceps. A piece of iron, 3½ lines long by 2 lines broad, was thus removed, accompanied by a little blood and pus. The eye gradually shrank without the annoyance of suppuration of the vitreous.—*Archives of Ophthalmology and Otology*, vol. i. p. 30.

DISLOCATION OF THE LENS INTO THE CORPUS VITREUM, AND AFTERWARDS INTO THE ANTERIOR CHAMBER. BY DR HENRY D. NOYES, NEW YORK.

A man in a drunken brawl received a blow with the fist on his left eye. When examined, three weeks later, by Dr Watts, the lens was found displaced directly downward in a vertical plane, its upper border projecting above the rim of the enlarged pupil, atropine having been previously applied to the eye. About a week after he said his sight had greatly improved, so that he was now able to read. The lens was found to have come forward into the anterior chamber. This change of position had been brought about by a vigorous fit of sneezing. On the evening of the last day when he visited the Infirmary, and when atropine had been put into the eye, he took a pinch of "catarrh-snuff," and sneezed seven or eight times. He immediately afterwards found his sight improved. From the altered position of the lens (which retained its transparency) Dr Noyes expected to find the eye astigmatic, and, if formerly of normal refraction, myopic. On examination, the uninjured eye was found to be hypermetropic ($\frac{1}{18}$), while the other was myopic ($\frac{1}{9}$), astigmatic ($\frac{1}{24}$). The injured eye at that time was free from irritation, so no operative interference was adopted, but the patient warned to return at once should irritation ensue. This advice was disregarded, for when the patient returned after a month's absence the eye was found in a state of complete glaucoma, and the patient had suffered severely for a considerable time, but been dissuaded by his friends from returning sooner to the Infirmary. All perception of light had been lost; the lens was opaque; the eyeball hard and painful on pressure. To allay the irritation extraction of the lens was undertaken. The operation was followed by the desired result.—*Archives of Ophthalmology and Otology*, vol. i. p. 37.

PHYSIOLOGICAL NOTES.

M. BERT has been instituting a series of experiments in illustration of "The Phenomena and Causes of the Death of Fresh-water Animals when plunged into Sea-water."

1. *The duration of survival* varies in different species. The fol-

lowing are the mean results:—Bleak, 18 minutes; roach and minnows, 25 m.; *chevaines*, 30 m.; tench and gudgeon, 35 m.; loach and carp, 50 m.; gold fishes, 1 h.; perch, 1 h. 15 m.; grayling, 2 h. to 3 h.; a salmon a year old, about 6 h.; sticklebacks *(G. leiurus)*, from 2 h. to a month or longer; eels (4 to 6 inches long), from a day to a week or more.

Frogs, 1 h.; tadpoles, 45 m.

Daphnias (water-fleas), 10 m.; cyclopes, 20 m.; larvæ of *Chieronanus*, 1 h.; those of *Ephemera*, 2 h., and those of *Corethra plumicornis*, 5 h. or 6 h.; crayfish, 30 h.

These observations were made at a mean temperature of 15° or 16° C. The colder the water is, so much the longer does the animal survive. Thus, at 9° a minnow dies in 30 m.; at 12°, in 25 m.; at 22°, in 14 m.; and at 28°, in 9 m.

2. *The phenomena that precede and accompany death* were examined in a carp and in a frog.

A carp plunged in sea-water is violently agitated for some (5 to 10) minutes, and then remains motionless, rising to the surface in consequence of its less specific weight. The respiration is at first accelerated and then becomes slow; the branchiæ at first assume a deep red-brick tint, which soon changes into a blackish hue; the anterior layer of the crystalline lens becomes opaque; the body becomes covered with a thick mucus; sensibility disappears, and all movement ceases. If now plunged into fresh water it exhibits no signs of life, and yet the muscular contractility is intact, and, on the application of an irritant to the spinal cord, the muscles contract and the heart continues to beat.

On examining the highly-congested branchiæ, and washing them with a fluid that does not affect the blood-corpuscles, the latter are seen to be dentated and broken, and heaped up in entangled masses.

A frog, when immersed in sea-water, is much agitated, and exhibits signs of pain, unless he can keep his muzzle above the surface. When all signs of sensibility have disappeared the nerves and muscles are still found to be excitable, and the heart, filled with dark blood, is still seen to beat spontaneously. The blood-globules, even in the superficial veins, are unaffected, but the lens and sometimes the cornea of each eye become opaque. The animal is found to have lost from one-fifth to one-third of its weight, the loss being chiefly borne by the muscles, which present a continuous or durable contraction like a kind of cramp.

This loss of weight is very much greater than the loss experienced by fishes, which, when small, lose about 1-15th, and, when they are larger, present a very insignificant loss.

This physiologist further ascertained by experiments, in which artificial salt water was used, that a given quantity of sodium or magnesium is far more pernicious in the state of chloride than in that of sulphate.

M. Bert proposes to lay a second communication before the Academy, in which he will consider the reason why these chlorides are specially fatal.

Closely analogous to the investigations of M. Bert are those of M. Felix Plateau, the Belgian physicist. His original article appears in the last volume of the "Mémoires Couronnés," published by the Royal Academy of Belgium, and is thus analyzed by Professor Schwann. In his "Physico-Chemical Researches on the Aquatic Articulata," M. Plateau goes far in advance of all observers of the allied subject, "Why fresh-water fishes cannot live in salt water and *vice versa*." As might be expected, he finds that of the fresh-water articulata which he plunged in sea-water, those which had an aerial respiration could bear the change, while those in which the respiration was branchial and cutaneous died with a rapidity that seemed proportional to the activity of their respiratory action. That the difference of the densities of fresh and sea water were not the cause of their death is obvious, because if the fresh water be treated with sugar till it attains the density of salt water most of the animals are scarcely affected. Hence the saline matters, or some of them, must be the poisonous agents. To find out what was the noxious ingredient, he made solutions of the chief salts found in sea-water—of the chlorides of sodium, potassium, and magnesium, and the sulphates of magnesia and lime. Each solution contained only one or two of these substances, which were added so as to equal the residue left by a corresponding volume of sea-water. The result of the experiments showed that the solution of the chlorides of sodium and magnesium were as poisonous as sea-water; while those of the sulphates had little effect.

M. Plateau shows that these fresh-water animals when living in sea-water, or in the solutions of the chlorides, absorb the last-named salts into their bodies, and restore them if placed in a little distilled water, all having been carefully washed, while the sulphates are scarcely at all absorbed.

In another set of experiments he plunged marine articulata in fresh water. They all died in little more than nine hours; and analysis showed that they gave off the chloride of sodium of their bodies to the surrounding fresh water. In this case the different density of the medium was not the cause of death, since they did not live much longer in water sugared up to the density of sea-water than in ordinary fresh water. The presence of the chlorides is consequently the condition that is indispensable for their existence.

Finally, he shows that all these facts are capable of being explained by the laws of endosmosis, diffusion, and dialysis; and that it is in consequence of the slight diffusibility of the sulphates that they are harmless as compared with the chlorides.

Part Fourth.

MEDICAL NEWS.

OBITUARY.—On the 24th September, SAMUEL SOLLY, F.R.S., died somewhat suddenly, though not altogether unexpectedly, as for a year past he had been laid aside by illness from professional duties. Mr Solly for many years taught surgery and clinical surgery, and his teaching has been embodied in his work entitled "Surgical Experiences." But his name is perhaps better known in connexion with his researches on the structure of the brain, which gained him his Fellowship of the Royal Society. *Tempora mutantur*, and Solly on the brain is not so well known as it once was; but the author did good service in his day and generation, and his name is one certain of a niche in any medical Walhalla—*Eheu! fugaces, fugaces, labantur anni.*

FRASER THOMSON, M.D., L.R.C.S.E., F.R.S.E., for many years enjoyed the leading practice in Perth, his native city. His father was a clergyman of note, and a brother of the well-known Rev. Dr Andrew Thomson, of Edinburgh. Dr Fraser Thomson was an able microscopist, and especially fond of zoological studies, and in our own pages he has recorded some of his more interesting medical cases. He died very suddenly, in crossing the Perth station, immediately on his arrival by train from Edinburgh.

ANNIVERSARY OF VON GRAEFE'S BURIAL.—On Sunday, the 23d July, the Berlin Medical Society celebrated the anniversary (of Von Graefe's burial) by placing on his grave a laurel wreath. Von Graefe was President of the Society from its foundation till his death. A very large number of medical men attended and witnessed the ceremony. Professor Langenbeck, his successor as President of the Society, delivered an address on the occasion, of which the following was the conclusion:—"The crown of laurel which we to-day in affectionate remembrance lay upon his grave will, like ourselves, fade; but the imperishable laurel which science has wreathed for him will flourish and bear new fruit so long as science endures."

ON A MEANS OF AVERTING THE SPREAD OF SMALLPOX.—Dr John Day of Geelong, in a paper read before the Medical Society of Victoria, has suggested the employment of the peroxide of hydrogen as a means of averting the spread of smallpox. He believes that the virus is always associated with pus-cells, and that the only way it can be destroyed is by oxidation. He has found that pus-cells possess, in a very high degree, the power of transforming antozone into ozone—the oxygen of combination. Peroxide of hydrogen, according to Schönbein, consists of antozone and water. In effecting this transformation, the pus-cells do not themselves undergo any very rapid oxidation; a large proportion of the ozone is thus generated in a free state, ready to combine with any oxidizable substance near. Thus he believes that if peroxide of hydrogen was brought into contact with pus-cells containing smallpox virus, ozone would be generated and the virus destroyed. The form of peroxide of hydrogen he recommends is Robbin's ozonic ether, which is a compound of peroxide of hydrogen with absolute ether. It may be readily diffused, even through the wards of an hospital, by a spray apparatus, and is very persistent and powerful in its action, at once destroying sulphuretted hydrogen and other noxious gases. Letters written from smallpox houses have before now been the means of conveying the infection of the disease, but Dr Day shows that they may readily be disinfected, without injury to the writing, by spraying them lightly with ozonic ether. Dr Day suggests that the bodies of smallpox patients should be sponged once or twice a day with a mixture of ozonic ether and tepid water, which would certainly remove the nauseous odour which always accompanies the suppurative stage, and also, he hopes, destroy the active virus by which smallpox is propagated. The ozonic ether might also be mixed with the collodion, cold cream, or lard so often used in the topical medication of smallpox. The high price of ozonic ether might be lessened by employing, instead of pure ether, methylated ether, which is very cheap, and would answer quite as well for disinfecting purposes. Further, oil of turpentine, when exposed to light and air, rapidly absorbs antozone, and might then be usefully employed, either alone or in solution in methylated spirit, which dissolves it in all proportions, in disinfecting the flooring, skirting, and other woodwork in places in which smallpox has appeared.—*Pamphlet forwarded by author.*

A NEW SHEETING FOR SPLINTS has been patented by Mr Cocking of Penzance, which softens readily by heat and rapidly hardens again on cooling, so that it can be readily and easily moulded to a limb. It seems to be a combination of shoddy with the gums used to stiffen the framework of hats; and those of our country brethren who may happen to have employed old hats in the making of extempore splints, will appreciate a material which is softer, firmer, and quite as easily manipulated.

The London agent for THE NEW YORK LIFE INSURANCE COMPANY requests us to state that this company—although not coming under the requirements of the "Life Assurance Act of August 9, 1870," which requires all foreign life companies commencing business here *after* the passage of the Act, to deposit £20,000 with the Accountant-General in Chancery before commencing business here—has decided to make a deposit of funds in London for the security of policyholders of Great Britain and Ireland, and has commenced by depositing this day 100,000 dols. in United States bonds, worth to-day over £21,000, in the hands of the following trustees:—Sir Frederick Arrow, Knight, Deputy Master, Trinity House; Frederick Francis, Esq., Director, London and County Bank; A. H. Phillpotts, Esq., Director, Bank of British North America. The company has agreed, in the deed of trust to the trustees, that in the event of a claim upon any policy being disputed, they will submit the same to the decision of the British courts.

Recent Researches on Flight.—Of late the perplexing problem of flight has received a greater amount of attention from physiologists and savants than has been bestowed upon it for years, and the result of their researches and experiences is in a fair way of becoming remarkable for its fruit-bearing character. Whilst abroad such men as Borelli, Straus-Durckheim, Chabrier, Girard, and Marey, have severally given to the world the gist of their labours in this branch of science, at home His Grace the Duke of Argyll and Dr J. Bell Pettigrew have awakened our deep interest by their views on natural and artificial flight. To the latter is due the honour of giving birth to the celebrated "figure-of-8 wave theory," that is now attracting so much notice in our aeronautical schools.

As early as 1867, Dr Pettigrew delivered, before the Royal Institution of Great Britain, a lecture in which he propounded that novel theory, and in 1868 he published, in the "Transactions" of the Linnean Society, an elaborate memoir on "The Mechanical Appliances by which Flight is attained in the Animal Kingdom." The year after, Professor J. E. Marey, in the "Revue des Cours Scientifiques," bore out Dr Pettigrew's ideas by the detail of his experiments with the sphygmograph, with which he succeeded in causing the wings of insects and birds to register their own movements. He says—"But if the frequency of the movements of the wing vary, the *form* does not vary. It is invariably the same; it is always *a double loop, a figure of* 8. Whether this figure be more or less apparent, whether its branches be more or less equal, matters little; it exists, and an attentive examination will not fail to reveal it." An indefatigable worker, Dr Pettigrew continued without pausing the task to which he had set himself—and that to him is indeed a labour of love; and in this year's "Transactions" of the Royal Society of Edinburgh we have from his pen a complete monograph on "The Physiology of Wings," in which he treats with equal felicity of both natural and artificial flight. The mass of interesting fact brought to light by the author is too copious to allow of lengthened dissertation, but from it we abstract the following items:—

The wing is generally triangular in form. It is finely graduated, and tapers from the root towards the tip. It is likewise slightly twisted upon itself, and this remark holds true also of the primary or rowing feathers of the wing of the bird. The wing is convex above and concave below; this shape, and the fact that in flight the wing is carried obliquely forward like a kite, enabling it to penetrate the air with its dorsal surface during the up stroke, and to seize it with its ventral one alike during the down and up strokes. The wing is movable in all its parts; it is also elastic. Its power of changing forms enables it to be wielded intelligently, even to its extremity; its elasticity prevents shock, and contributes to its continued play. The wing of the insect is usually in one piece; that of the bat and bird always in several. The curtain of the wing is continuous in the bat, because of a delicate elastic membrane which extends between the fingers of the hand and along the arm; that of the bird is non-continuous, owing to the presence of feathers, which open and close like so many valves during the up and down strokes.

The posterior margin of the wing of the insect, bat, and bird, is rotated *downwards and forwards* during extension, and *upwards and backwards* during flexion. The wing during its vibration descends further below the body than it rises above it. This is necessary for elevating purposes. The distal portion of the wing is twisted in a downward *and forward direction* at the end of the down stroke, whereas at the end of the up stroke it is twisted *downwards* and backwards. The wing during its vibrations *twists* and *untwists*, so that it acts as a reversing reciprocating screw. The wing is consequently a screw, *structurally* and *functionally*. The blur or impression produced on the eye by the rapidly-oscillating wing is *twisted upon itself*, and resembles the blade of an ordinary screw-propeller. The twisted configuration of the wing and its screwing action are due to the presence of figure-of-8 looped curves on its anterior and posterior margins; these curves, when the wing is vibrating, reversing, and reciprocating in such a manner as to make the wing change form in all its parts.

We may further point out that Dr Pettigrew has not based his ideas on the structure of wings on mere theoretical considerations. Besides elaborate anatomical examination, he has entered with a true experimental spirit into a close study of the visible movements of most of the winged tribe. The very excellent diagramatic views with which his paper is elaborately illustrated convey at a glance much that it is difficult to express in words. In proof of this the reader need but compare those figures bearing on the wing movements of the butterfly, the dragon-fly, and the bird.—*Land and Water.*

PHTHISIS AND DEATHS IN THE MELBOURNE HOSPITAL.—During the eight weeks ending on the 16th June, 71 persons—exclusive of natives of the colony—died in the Melbourne Hospital. 17, or 24 per cent., of the deaths were occasioned by consumption. The persons who died of phthisis had resided 21, 1, 10, 18, 3, 17, 8, 16, 17, 15, 3, 7, 13, 3, 6, and 8 years respectively in Victoria, or an average of nearly 10½ years each. The length of residence in the colony of one person was not known.—*Australian Medical Gazette.*

ROYAL COLLEGE OF SURGEONS, EDINBURGH.—At the annual meeting of the Royal College of Surgeons, Edinburgh, held on 18th instant, the following office-bearers were elected for the ensuing year:—*President*, William Walker. *Secretary*, James Simson, M.D. *Treasurer*, John Gairdner, M.D. *Librarian*, Archibald Inglis, M.D. *President's Council*, Andrew Wood, M.D.; Robert Omond, M.D.; James Dunsmure, M.D.; James D. Gillespie, M.D.; James Spence; Henry D. Littlejohn, M.D.; *Ex officio*, John Gairdner, M.D. *Examiners*, Archibald Inglis, M.D.; Robert Omond, M.D.; James Dunsmure, M.D; Peter David Handyside, M.D.; James D. Gillespie, M.D.; Henry D. Littlejohn, M.D.; Patrick H. Watson, M.D.; David Wilson, M.D.; John Smith, M.D.; Argyll Robertson, M.D.; Joseph Bell, M.D.; Thomas Annandale. *Assessors to Examiners*, James S. Combe, M.D.; William Brown; James Spence; James Simson. *Conservator of Museum*, James B. Pettigrew, M.D. *Assistant to Conservator*, James Grandison. *Officer*, John Dickie.

ROYAL INFIRMARY.—Dr JOHN CHIENE, F.R.C.S.E., formerly Demonstrator of Anatomy in the University of Edinburgh, has been appointed Assistant Surgeon to fill the vacancy caused by the retirement of Dr Gillespie.

DR JOHN WILLIAM OGLE has been appointed Inspector of Anatomy in England and Wales in place of the late Dr Cursham.

PERIODICALS RECEIVED.

American Journal of Obstetrics,—August.
American Journal of Syphilography and Dermatology,—October.
American Practitioner,—Sept., Oct.
Annales d'Oculistique,—July, August.
Archives of Ophthalmology and Otology,—Vol. i. Nos. 1, 2; Vol. ii. No. 1.
Australian Medical Gazette,—June.
Berliner Klin. Wochenschrift,—August 28 to October 23.
Births, Deaths, and Marriages, Monthly Return, of,—August, September.
Boston Medical and Surgical Journal, Oct. 5.
British and Foreign Medico-Chirurgical Review,—October.
British Medical Journal,—Aug. 26 to Oct 21.
Bulletin Général de Thérapeutique,—Aug. 30 to Oct. 15.
Dublin Quarterly Journal of Medical Science,—August.
Food Journal,—Aug., Sept., Oct.
Gazette des Hôpitaux,—June 15 to Oct. 19.
Gazette Hebomadaire de Médecine, etc.,—Aug. 25 to Oct. 20.
Glasgow Medical Journal,—August.
Journal of Mental Science,—October.
Journal of the Gynæcological Society of Boston,—September, October.
Journal of the Royal Agricultural Society of England,—No. 14.
Journal of the Scottish Meteorological Society,—July.
Madras Monthly Journal of Medical Science,—August, September.
Medical Press,—July 5 to October 25.
Medical Times and Gazette,—August 26 to October 21.
Medical World,—September, October.
Medizinische Jahrbücher,—Jahrgang 1871, Heft 3.
New Remedies,—July.
New York Med. Journal,—July, Aug., Sept.
Philadelphia Medical and Surgical Reporter,—August 5 to September 23.
Philadelphia Medical Times,—Aug. 15 to October 2.
Practitioner,—September, October.
Revue de Thérapeutique Medico-Chirurgicale,—September 1 to October 15.
Virchow's Archiv,—August 15.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Sympathetic Insanity illustrated—The Influence of the Body on the Mind, and the Mind on the Body.* By ARTHUR MITCHELL, M.A., M.D., F.R.S.E., etc., Commissioner in Lunacy for Scotland.

(*Continued from page* 304.)

MOREL says that the brain is always the seat of the insanity, though it is not always the seat of the cause. By this he meant, that insanity may be determined by a sympathy of the brain with morbid action in some *remote* part of the body. That this often happens we have already shown, but Dr Maudsley points out that the centre of morbid irritation, which gives rise to secondary disorder by reflex or sympathetic action, need not of necessity be in a distant organ—it may be in the brain itself. Thus, he says:—"A tumour, abscess, or local softening in the brain may nowise interfere with the mental operations at one time, while at another it produces the gravest disorder of them; and it is not uncommon in abscess of the brain for the symptoms of mental derangement, when there are any, to disappear entirely for a time, and then to return suddenly in all their gravity"—that is, there may be a secondary and sudden derangement or abolition of function by sympathetic or reflex action. "Instances now and then occur," the same able writer points out, "in which a sudden loss of consciousness, or a sudden incoherence, or sudden mania, or even sudden death, takes place, where no premonitory symptoms have indicated grave local disease of the brain," though grave disease existed there.

I direct attention to this form of reflex insanity, because I think it probable that cases will occur to many of my readers, which cannot be satisfactorily explained except on some such theory as that ingeniously advanced by Dr Maudsley.

It is necessary for this view to look on the tumour or abscess as external to the brain though within the skull. In epilepsy caused by tumours or osseous deposits within the skull, the fits are probably often determined in this way. It may be difficult to explain why, in such circumstances, fits suddenly occur, and why all is right in the intervals—why, on the contrary, there are not continuous convulsions, the tumour or spiculum of bone being always there. We know, however, that there are unceasing changes in the circulation of the blood in the brain as regards quantity, quality, and distribution; in other words, the conditions are liable to important variations, and perhaps this may be sufficient in some way to account for the sudden fits of sympathetic disturbance to which allusion has been made. Whatever be their explanation, however, the phenomena are not more remarkable than that an unextracted bullet should at times cause great and at times no suffering.

One lesson we learn from these excessive derangements of the mind, which come suddenly and pass away quickly and completely, namely, that great functional disorders of the brain are possible without structural changes in it, for it is impossible that these last —the structural changes—could come and go with the appearance and disappearance of the abnormal mental phenomena.

So much for this form of sympathetic insanity.

In many of the morbid conditions we have been discussing, it was seen that particular trains of mental symptoms resulted from particular bodily states. In insanity which springs from irritation in remote organs, the delusions have sometimes a close relation to the functions of those organs—the sexual hallucinations which often present themselves when the irritation lies in the ovaries, are an illustration of this. But such relations of mental to bodily states of disease are equally interesting when they are not associated with the functions of the organs in which the eccentric irritations exist. They are scarcely less so when it is doubtful whether they are properly due to eccentric irritation, and do not rather originate in primary disorder of the brain, the definite signs of bodily disease being perhaps a sequence.

In that morbid state, for instance, which is commonly known as the general paralysis of the insane, the corporeal and the mental lesions are equally profound and equally distinctive. I shall endeavour briefly to describe them both; but it must be understood that my description applies to typical cases, and that in this, as in all other diseases, the signs are sometimes more and sometimes less marked.

First, as regards the bodily disorder,—the progressive paralysis is usually first detected in the tongue, the articulation being difficult. It is then seen in the gait of the patient. He walks stiffly, and easily stumbles if the floor be uneven. Then the arms are similarly affected. As this goes on, the pronunciation of words becomes more difficult and indistinct, and the gait more unsteady, like that of a drunken man. A further progress, and the patient can no longer maintain himself erect, and language is impossible. During the course of his illness he has sudden attacks of loss of consciousness, often attended by convulsions.

Here, then, we have a train of physical symptoms, which are characteristic as well as grave. But the mental symptoms are neither less characteristic nor less grave. This form of progressive paralysis of the body is accompanied by a profound and remarkable insanity. The precursory mental phenomena may vary considerably, but, in the majority of patients, there soon come phenomena which have a broad, clear, and steady character—" grandiose and extravagant delusions which have no relation to the former *ego*, and include the most opposite and logically incompatible ideas as facts." Terrible as their condition may appear, even to an ordinary onlooker, they themselves serenely " extol their own feeling of wellbeing." They have millions of billions of money, thousands of castles, and fleets of ships; they build bridges to the sun, walk thousands of miles per day, wear cloth of gold, have countless wives and rivers of wine; nothing ails them. They tell you that they speak fluently, though they can scarcely speak at all when they tell you so. They say that they can walk and ride, though they can scarcely stand when they say it. These phenomena are from time to time interrupted by other states, but they may be fairly spoken of as characteristic and pervading. Sometimes, of course, they are more obscure than I have described them, but they have always more or less of the same character. Throughout the whole, there is a weakness of the intellect and will, and this weakness goes on to more decided dementia in the later stages of the malady.

It will be understood that I am not writing an account of general paralysis here. I am merely saying that about it which will show that it exhibits a steady and remarkable state of bodily disorder, with a like steady and remarkable state of mental disorder.

What has been said of this and of other states of insanity suggests the remark that there are physical as well as psychical signs of mental disease. Every one probably knows this, but few bear it sufficiently in mind. Are not the progressive paralysis, the congestive attacks, and the grandiose delusions, all signs of the form of mental disease called general paralysis of the insane? Are not dilatation, contraction, and inequality of the pupils, physical signs of insanity, aiding us both in determining its existence and its origin? It is true, of course, that these things may occur without mental derangement; but so may quick and laboured breathing without pneumonia, or a quick pulse and hot skin without the eruption of scarlatina. Yet the quick breathing, quick pulse, and hot skin are among the signs of these diseases; and so, among the signs of insanity there occur many of a physical nature, which are of great importance in shaping the prognosis and in guiding treatment.

In the general paralytic, of whom we have been speaking, there is a complete destruction of the comparing faculty, an alienation of the personality, a mental disorder of the deepest and gravest kind; but we find another class of cases—and a large one—in which a definite bodily state, or bodily disease, gives little more than a colour and a tone to mental action. This may be so slightly pronounced that we never think of calling it insanity, though in reality it differs from it only in degree. "Nature draws less-marked boundaries than science" would like to do, or than society for its convenience actually does, between sanity and insanity.

Who, for instance, is not familiar with a characteristic of the mental state of consumptives? I refer to their inability to realize their fate. What they have seen in others, and what they see in themselves, should certainly reveal it. They may know well that they are labouring under a disease "wherein 'tis as dangerous to be sentenced by a physician as by a judge," but in this matter they cannot use the comparing faculty in a healthy manner. And so they go on forming projects to be carried out when they recover, dreaming of happiness in the future, when all hope of it is already gone, and clinging to a delusion as to the state of their health, as Georget says, till death with a soft stroke breaks it. This is nothing but a low form of that mental state which is seen so strongly in the general paralytic. Whether the consumptive's state of mind arises from the fact, as Sir Thomas Browne says, that they feel not themselves dying, and therefore hope still to live, or whether it is a mere phase of the heightened mental activity which is believed to belong to scrofulosis, I cannot tell; but the last is the more probable explanation.

This activity of the cerebral centre, due to scrofulosis, is seen in the liveliness and precocity of scrofulous children; and many observers think that it takes special and æsthetic directions in the adult. Thus Dr Macartney says:—"There is a mental character belonging to the scrofulous habit, which more strikingly indicates the peculiar state of the constitution than all other signs. Scrofulous persons in general exhibit little mental energy, but a gentleness and amiability of disposition, a refinement and judgment in matters of taste, and a purity of moral feeling, which is sometimes so remarkable as to place them in these points beyond the scale, and even beyond the conception, of the mass of mankind."

On all hands, indeed, we meet with these minor displays of a steady alteration in mental action, as the result of particular bodily states. The psychical longings of pregnant women, for instance, furnish another good illustration.

Casper, who generally has hard views about the insane, admits and says of these phenomena that they "belong to the category of fixed ideas," and that, "in their inner nature, they are nothing else than fixed delusions."

We are scarcely accustomed to think of them in this light, but, nevertheless, it is scientifically correct. What else are they but abnormal or unhealthy mental states, which something in that peculiar condition of the body begets? It must be evident to every one that it would be a very grievous thing indeed if they were to continue through life; and it is only their transitoriness and their harmlessness which lead us to overlook their true significance. We call them whims and caprices, but we have only to intensify them a little and to prolong them, to make us feel that we might easily be forced to call them by another name. In the cases detailed by Shenck, for instance, these longings actually assumed such proportions and force as to constitute not only insanity, but a dangerous insanity.

Who, again, does not recognise phenomena of an exactly comparable character in the shyness, the evasive and cast-down look, the dull irresolute character, the conceited self-consciousness of the masturbator; in the religious colour which irritation in the sexual organs gives to melancholia; in the peevish, egotistic, uncertain, and depressed state of mind which attends indigestion; in the hypochondriac's selfish regard to his own health, his dwelling on trifles, his wavering emotions and resolutions, his timorousness and strange fancies? Are we not all aware of the great change of character which follows the physical changes constituting puberty? From the intellectual indolence of a young girl do we not infer that sexual development is being retarded, and from expressions of fantastic sentimentality that it is commencing?[1]

What passes in the economy to explain all these connexions and interminglings of body and mind, I cannot tell. The psycho-physical union, as Feuchtersleben has well said, is undefined as well as delicate. "The greatest disorganizations of the ganglionic system," he points out, "have frequently no influence on the state of the mind, while the smallest disturbances of that system are often sufficient most deeply to disorder it." We may have an ovarian tumour of enormous size with no apparent influence on mental action, while a trifling irritation in the ovary may send the patient to an asylum,—just as a man may have his hand shattered in the most formidable manner without having tetanus as a consequence, though a trifling cut on his finger may induce that disease. It is of importance to keep this in mind, so that we may avoid the error of dismissing the consideration of any alleged cause on the ground of its seeming insufficiency.

There must be *a something*, however, about the nature of these trifling eccentric irritations which makes them at times act so powerfully on the brain. At least this is probable; but what that something is, I cannot tell Perhaps it may be useful, however, to bear in mind that it is the *gentle* rubbing of the sole of the foot which causes laughter. A blow or a blister on it would have no such effect. It is the *tickling* of the fauces *with a feather* which produces vomiting.

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[1] Feuchtersleben, 193.

We can pass a ball probang or the tube of a stomach-pump, with little fear of causing the patient to vomit. What is it that happens to the peripheral nerves of the stomach to originate in the mind what we call hunger? When we remove hunger by filling the stomach, it looks as if we had rather increased than diminished the irritation of these nerves. It would seem, in short, that those eccentric irritations, which have so great an influence on the brain, have some special character, and are probably confined to the very peripheries of the nerves. Many writers acknowledge this; but they never get beyond the indication of an opinion that it must be something analogous to tickling. Thus Georget writes:—"The first dentition is often accompanied by cerebral injuries, which we can only attribute to the continual sensation of tickling, itching, or pain, which lasts for months and days without interruption, or is renewed from time to time, with shorter or longer intervals." We make little progress scientifically perhaps by this view of the matter; yet it has its use in forcing us to realize, when dealing with insanity, that the seeming insufficiency of such a cause may not be a real insufficiency, and that we may have a sympathetic or reflex disorder of the mind of the gravest possible character, from what looks a very trifling irritation in a remote part of the body—just as we may have convulsions from teething, or tetanus from a scratch on the finger.

There are other states still which illustrate the intermingling and interdependence of body and mind, to which allusion should be made. Most of what has been said in this and in the preceding paper, about the relations of mind and body, was so arranged as to explain what is meant by sympathetic or reflex insanity. But these relations are deep and wide. We find them everywhere, and it may be useful to refer to them, as they exist in such a state as that of dizziness.

We are all familiar with what is called dizziness; but some may not have thought much of the mental phenomena which it presents. That it is accompanied by "a state of mental confusion" all will allow. Let us look for a moment at the nature of this confusion, as it occurs in a simple and familiar case, which I take from Mason Good:—"In looking through a window, the objects that pass before us in regular order pass singly and without confusion; but if this order be interrupted by movements we are not accustomed to, they make us dizzy with their motion, and we see them confusedly and in delusive numbers." "The objects, or their representations, presented to the perception, appear sometimes to circumvolve horizontally from right to left, or perpendicularly from above downwards or from below upwards, or to be very whimsically changed in their form." And not unfrequently we ourselves may seem "to be moving as well, and commonly in a contrary direction to the apparent motion of the objects." These are just hallucinations of sight; and they are often accompanied by "illusory sounds, as of whispering or murmuring or beating of drums." The objects we see acquire motions they have not, and are magnified and distorted, and so also the gentlest and lightest tones—"the whisperings of a mere current of air in a room"—may seem to be the rushing of a cataract.

The sensation "of a buoyant undulation or swimming" is soon passed in persons whose nervous constitution is weak and mobile; and there comes then a state of mental confusion, with delusions of sight and hearing, which may possibly end in syncope and loss of consciousness.

Now, what does all this mean? The dizzy patient sees the room turning round, and hears the bells ringing; but he is under a mistake—the room never moves, and no bells ring. If the dizzy state, however, kept just at that point, what would happen? He would continue to see the circumvolving of the room, and to hear the ringing of the bells; and might, by-and-by, be unable to believe his friends when they assured him that no bells were ringing, and that the room was standing still. In short, he might lose his comparing faculty, and so become a lunatic.

No reference has yet been made to the manner in which the mind is influenced through the senses. Here body and mind may be regarded rather as melting into each other than as standing apart but related. Seeing involves a mental operation which has been excited by a peculiar irritation resulting from the action of light on the peripheral expansion of a portion of the brain, prolonged to the outside of the skull and arranged in a special manner in the eyeball. When thus put, it looks as if it were the very brain itself that saw; this, however, is not more true than that it is the very brain itself that feels, and hears, and tastes, and smells. In a certain sense, we may leave the brain intact and yet lose these senses. We may lose them, for instance, by simply destroying the peripheral arrangements of certain nerves which proceed from it. Descriptive anatomy confines the brain to the skull, but the nerves which leave the brain may be considered as still a part of it to their very end; and it is on the very end that light, sound, and odours act, and give rise to seeing, hearing, and smelling, which are really cerebral, and not ocular, aural, or nasal phenomena. So that here again we have definite mental results from irritations, produced by such soft and subtle agencies as waves of light, or waves of sound, or impalpable odours, on the peripheral expansions of nerves.

I can do nothing more than touch this subject, but I cannot leave it without giving an illustration of the way in which a disordered sense may lead to delusional insanity.

The eye, for example, is subject to diseases which may cause us to see objects double or quadruple; and, where the predisposing causes of mental disorder are sufficient, there may grow out of this error of sight an insane delusion. Though persons thus affected are usually not deceived, and know very well that there is only one object where there appear to be two, Hoffbauer says that, if they are disposed to mental disease, a state of delusional insanity may thus easily originate in them; and his commentator, Chambeyron, narrates a case very much to the point:—

"Towards the end of the year 1825, Madame N., a washerwoman, in consequence of violent rheumatic pains, gave up her occupation, and took to needlework. Being little accustomed to this new kind of work, she had to sit far into the night in order to gain enough to support her; notwithstanding this, she fell into want, and was attacked by a very acute ophthalmia, which after a time became chronic. But now, when she sewed, as she continued to do, she saw four hands, four needles, and four seams. Madame N. at first took a correct view of, and rightly understood this phenomenon, or at least referred it to its true cause; but after a short time, her poverty having increased and produced a strong impression on her mind, she became convinced that she was really sewing four seams at once, and that God, touched by her great misfortunes, had wrought a miracle in her favour."

We have here, therefore, an error of sight begetting an insane delusion, whose very character disclosed the alliance; and it becomes an interesting query whether, if we could have cured this woman's double diplopia, we should have put an end to the delusion which had taken possession of her. Professor Hagen furnishes us with a case, from the experience of Von Graefe, which gives an answer to the query. "A man, past middle age, had four years previously lost his sight in consequence of inflammation of both eyeballs. At the time when he came under observation the eyeballs were atrophied, and contained several calcareous deposits He had become subject to extraordinary sensations of light, which annoyed him night and day, and interfered with his falling asleep. Half a year before he had suffered from a severe emotional shock, after which the appearances of mere light and colour (such as coloured spots, red luminous balls, etc.) became so far modified as to assume, when he was most troubled with them, special forms, such as heads of horses and asses. He also saw human faces, resembling those he had been acquainted with, and believed that he was actually surrounded by these acquaintances. The operation of neurotomy was performed, and there were no appearances of light or colour, nor hallucinations, during the week following the operation, although previously he never passed a day without them."

There is still one point to which I would refer before concluding my remarks on the influence of body on mind.

It is well known that the mental phenomena which result from intoxication by different substances are not the same. These phenomena have not been studied with the attention they merit; but it is acknowledged that in the intoxication produced by alcohol, belladonna, opium, or cannabis Indica, the mental states differ greatly, and that the character of these differences may be called constant. These substances act differently on the body,—as we see in the dilated pupil from belladonna, and the contracted pupil from opium; and there are corresponding differences in their actions on the mind. Perhaps the mental disturbances which result from the long-continued use of intoxicating agents, resemble each other more closely than do the immediate psychical effects. Delirium tremens, as we see it, with its very distinctive and well-known mental disorder, is nearly always the result of the long and excessive use of alcohol; but a state differing little from it may result from a similar use of other intoxicating agents. Some of these, however, produce it more readily than others. It was even thought by Jungken of Berlin that alcohol distilled from the potato is more apt to induce this form of delirium than alcohol distilled from barley. As the potato belongs to the same natural family as the belladonna, he thought that some volatile principle passed over with the alcohol distilled from it, in very small quantity it is true, but still in sufficient quantity to influence the effects arising from its long-continued use.

The delirium of the exanthemata is in some measure of the nature of an intoxication. It is something more than such a delirium as attends a local inflammation with high fever. It is the result, to some extent, of a special toxic agent; and there is, depending on this, a difference between the delirium of scarlet fever and that of typhus, or measles, or smallpox. In this opinion I believe I am supported by our best practical physicians. No one, however, so far as I am aware, has attempted to describe the characters which these toxic agents respectively impress on the delirium which they may produce; but I venture to predict that, ere long, we shall have phenomena of this kind more carefully observed and analyzed than they have hitherto been.

Delirium, described broadly, is a "rapid flight and mutation of ideas, which the patient cannot command." "Consciousness," as Ideler expresses it, "seems to have been broken into fragments, which are thrown up in wild confusion by the flood." But I am myself satisfied that there may be and often is a method in this wild confusion; that there may be eddies, and rapids, and pools in the flood which throws the fragments up; and that there may thus be a sorting of them, which will give a character to the delirium.

This concludes what I have to say on the influence of *body on mind.* I have spoken chiefly of the graver aspects of that influence, because these are what I am led most to think of; and I have written of the subject as I am in the habit of thinking of it—choosing my illustrations chiefly from the domain of disease, or from that adjoining domain wherein we find the *morbi omissi* of Cullen—*quos omisisse fortassis non oportebat.*

We pass now to a consideration of the influence of *mind on body*—in other words, to notice some of those corporeal phenomena which follow, and which appear to depend on certain operations of the mind. In considering this aspect of the matter, I think it will be found that we throw additional light on those actions of body on mind to which we have just been referring.

There is an involuntary bodily result of a mental emotion, which is so frequent and so familiar that it passes with little consideration; but it is nevertheless in its way a phenomenon quite as strange and startling as a convulsion, or a dance of St Vitus. I refer to blushing.

The particular emotions which may give rise to blushing it is not easy to define; but I am at least safe in saying that there is a close alliance among them. In other words, it is true, in a broad and general sense, that it is a special, and not an indefinite operation of the mind which brings to the cheek what Müller calls a "vital turgescence of the bloodvessels," and what the poet calls "a living blaze of blood." The emotion, perhaps, can be best described as a feeling of shame. Wounded modesty, a consciousness of being blameworthy, of being the subject of remark and observation, or of embarrasment in having to speak to strangers or superiors, and a host of things, differing yet similar, may call up this feeling of shame, which in its turn may call up the blush.

A more manifest physical effect of a mental operation we could scarcely have—the same mental operation tending always to produce the same physical result. As we think of it, we cannot help asking if it be not possible that other emotions produce effects on the body quite as real as this, though not so apparent. That it is more than possible we shall shortly see.

The feeling of shame, however, does not bring a blush to every cheek. In the sensitive, or the nervously mobile, it is surest to do so—not because the emotions are always stronger in them, but because they are less under control. Such persons are in what we have so often alluded to as a state of preparation or predisposition. There is comfort in believing that, as we get old and cease to blush, it is not altogether because we have lost the feeling of shame, but because the growth of other faculties of mind keeps the emotional ones more in check. Jeremiah, however, raises a misgiving as to the correctness of this view, when he says—"Nay, they were not at all ashamed, neither could they blush;" and when he adds, "Therefore, shall they fall amongst them that fall," he starts a doubt as to the advantage of great stolidity.

But, be this as it may, it will be agreed that we have in blushing a remarkable illustration of the influence of the mind on the body. We shall not have a less remarkable one, if we turn our attention from the warm blush of shame to the cold pallor of fear. When great or sudden fear falls on a man, every one knows the physical effects which follow—the cold shiver, the *cutis anserina* or *horripilatio*, the change in the physiognomy, the pallor of the face, the dry mouth, and the sharp pain over the heart.

It is here, too, as in all the phenomena we have examined—different men are influenced by the same emotion in different degrees. We have the *constitutionally* fearful and the fearless, the timid and the bold; but we have none whom fear causes to blush or to laugh, for when fear is strong enough to show itself by physical signs, these are always of the same character.

Under the influence of fear the mouth dries and speech becomes difficult; and Annesley tells us that this physical effect of a mental state has been turned to practical account by the jugglers of India. When a theft has been committed, and they are asked to find out the thief, they gather all the inmates of the house, give each some dry rice to chew, and make them spit it out on a leaf. That which the thief has chewed will be dry.

Hilarity and sadness, again, affect the body in very different but in characteristic ways. The first increases the respiratory movements and the circulation of the blood. The second does the reverse. This of course must influence the health of every part of the body. Prout shows that there is more carbonic acid exhaled in the excitement of joy than in the depression of sorrow, and Schweigger confirms this. The blood is thus changed, and with it the whole nutrition of the body. "Compare the man," says Bichat, "whose every hour is marked by grief, with him whose days are passed in peace of heart and tranquillity of soul, and you will see what a difference distinguishes the nutrition of the one from the other." Grave diseases of the body may thus be induced. They are so, indeed, more frequently than is generally supposed. And thus we have sympathetic corporeal, as well as sympathetic mental diseases. It would be a practical advantage, I believe, to the art of healing, if the mental phenomena which precede or accompany bodily disorders were more studied than they are. Not many think of the first signs of fevers as cerebral, yet it has been well pointed out by Georget that they are so to a great extent—the headache, the troubled sleep, the false sensations of heat and cold, the inability to fix the attention, the weariness or lassitude of the intellectual faculties, the indifference, which marks a feebleness of the emotional faculties,—what are these but cerebral and mental phenomena?

But we have not yet done with the corporeal expressions of the states of hilarity and sadness.

The first leads often to laughter, and the last to sighs, and sobs, and tears. These are bodily expressions of mental states, whose utterance is plain and distinct. Who has not put his hand over his heart and said that it felt like a lump of lead, when the sorrow that is brought by the death of friends had fallen upon him? Who has not felt uneasiness and distress over the stomach, when stung by remorse or a qualm of conscience? Who has not felt his appetite *suddenly* go by the *sudden* receipt of bad news? Who has not felt it permanently affected by a continued sorrow, which he could not throw off, by hope deferred, or by prolonged anxiety? These are all bodily expressions of mental states. Their utterance perhaps may be less loud and distinct, but still it is not doubtful. He, of course, who has never known a sorrow in his life will not have felt, and may not understand, what is here described. With such a being, however, as Reid says, " it is scarcely possible to feel a sense of friendship or even of fellow-creatureship," and it is unnecessary to assume his existence.

There is a lesson in all this which is plain. Certain emotions of the mind act healthfully, while others act injuriously on the body. We should, therefore, exercise and cultivate those which do us good. Cheerfulness, for instance, is a state of mind which should certainly be cultivated into a habit. The muscles are strengthened by exercise, the memory is strengthened by exercise, and so is this state of mind—a state conducive to the health of other states, fortifying the whole. It has been well said by John Reid, that "A man may be merry on principle, and make a point occasionally of taking a laugh, as others do a walk, for the benefit of his health." If this be true, it is a justifiable hypocrisy to put on the appearance of cheerfulness, since, " by seeming gay, we grow to what we seem."

One of the common physical expressions of sorrow is weeping. In this we find a mental operation causing the secretion of a gland to be greatly increased. We have many other illustrations of the same thing The cry of a child, for instance, will suddenly fill a mother's breast with milk; and most of us have an old recollection of the effects on the mouth of an observational fit opposite a pastry-shop window. Such phenomena as these are so familiar to us, that we fail to see how deep their meaning is. Do they not, for instance, render it in a high degree probable that other glands are similarly influenced, though we have not the ocular demonstration of the influence, and though it may really be of a much slighter character, and that our thoughts and emotions may thus in the widest and broadest manner operate on our whole bodily condition?

The salivary glands are usually excited to an active secretion by the motion of the jaws in mastication; but the stimulus may come from the stomach, as in the case alluded to by Burdach and observed by Gairdner, where the œsophagus was divided, and where five to eight ounces of saliva flowed into the mouth every time that soup was injected into the stomach. This was a sympathetic action between different but related parts of the body. But the same physical result may follow a mere mental operation, as we knew, when we longed as boys to eat the cakes we looked at. It was not even necessary, however, that we should look at them. We could call up the longing by simply thinking of them, and the same flow of saliva would result. So it is that some people, by merely thinking of an odour which they greatly dislike, may sicken, vomit, and faint, which is certainly a strong corporeal expression of a purely mental operation. If syncope occurred, as it might do in such a case, we should have a particular mental act producing an effect on the body, which in its turn so acted on the mind as to cause complete unconsciousness or utter fatuity for the time being.

The recollection of physical pain, or of mental anguish, may produce similar effects. The body may fall down under the disturbance of the emotions thus excited, as it would before a bullet; and, if there be organic disease about the heart, or much general weakness and exhaustion, the body may lie where it falls, kept there by the hold of death.

The physical effects of what Burdach calls *l'idée de la fonction* are best seen, perhaps, in the sexual organs, as for instance in the *tensio phalli, visâ muliere nudâ, etiam in insomnio.*[1] When we get to pathological states, these strange connexions of mind with the sexual or reproductive organs assume a high practical importance. It is certainly much safer to have the mind intensely and continuously determined to a problem, than to this passion. There are both mental and physical results from castration, and the eunuch is not so much a man in his mind as he would have been had he been left unmutilated in his body. He becomes psychically effeminate, so that of a strong-minded female in the presence of such a being, we might almost properly say with Sterne, *Hic mulier, hæc vir.*

The face has been called, by Georget I think, *the mirror of the mind.* So completely are the movements of the muscles regulated by the emotions, that in the actions of the former the last may be read. What else but states of mind do we learn from the sparkling eye, the smile, the simper, the smirk, the grin, the frown, the scowl, the depressed eyebrows, or the tightened lips? Indeed, as the *Adventurer* puts it, "the predominant passion may generally be discovered in the countenance, because the muscles by which it is expressed, being so often called into action, acquire power, and overrule the others, so that the expression remains when the passion is suspended." If certain emotions are much exercised in very early life, the bones themselves are undoubtedly shaped by the play of the muscles on them. The moral from which is, that "Those who wish to be lovely should learn early to be good;" since it is certain that faces are made charming or repulsive by the habitual action of the mind on the muscles of expression, especially in early life.

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[1] Maudsley, Phys. and Path. of the Mind, p. 241.

It is nothing but an extension of this thought to point out how much our very language is influenced by a recognition of this action of mind on body. To leap with joy; to be dried up with envy; to be consumed with remorse; to be weighted with sorrow and bent with grief; to be down in the mouth, or sick at heart, or chop-fallen with disappointment; to have one's stomach turned with disgust, or one's mouth made to water with longing; to turn white as a sheet, to have the skin creeping, or to shake with fear; to open the mouth or look blank with amazement,—phrases like these are not poetic metaphors, but dry physiological truths.

In these papers a state of mind has often been spoken of as *the cause* of a state of body, or *vice versa;* but the cause, of course, had in its turn a cause, and so on backwards—to what we cannot often tell. It seems desirable, therefore, to point out that, in speaking of *causes* here, little more is meant than related antecedents. We have, indeed, not yet travelled far beyond this, but the journey we have made may nevertheless be important and productive of useful discovery.

Up to this point we have alluded only to those influences of mind on body which are involuntary, or nearly so; but there are others which we can bring about at pleasure.

I do not refer to those obscure results of will or attention which are disclosed in such things as the impaired speech that follows loss of hearing, when the speaker becomes unable to regulate the pitch of his voice. The brain, in such cases, can still send a message to the muscles of voice to act in this or that way, but it is not informed through the ear whether the instructions were just what they should have been to secure the proper pitch, on which information further orders to the muscles of voice would be founded. We are not conscious of giving any attention to this matter, though we really do give it. But it is not to such phenomena I refer when I speak of the influence of mental on bodily states which we can exhibit at pleasure. I refer rather to the effects of voluntarily and forcibly directing the attention to particular bodily organs. Sir Henry Holland, writing in 1852, says:—"The influence of the will on the voluntary organs, and of the passions and emotions of mind upon other parts of the animal economy, have long been the subject of study. Not equally so the influence of the consciousness thus directed by voluntary effort to particular organs and parts of the body—a faculty which, to a certain extent, the mind undoubtedly possesses." "It may be exercised as a mental act, without the suggestion of previous sensation from these parts," though it may require some effort and habit of mental control so to exercise it. "Stimulated attention," he says further, "will give a local sense of arterial pulsation where not previously felt, and create or augment those singing and rushing noises in the ears, which probably depend on the circulation through the capillary vessels."

A similar concentration of consciousness on the region of the stomach creates in these parts a sense of weight, oppression, or other less definite uneasiness. Perhaps there are effects produced in the stomach by simply directing the attention to it, like those we can actually see produced, by the play of the emotions, in the salivary glands or in the mammæ.

If we direct the attention resolutely to the brain itself, there arises an indefinable feeling of tightness, uneasiness, and weariness, which forces us to discontinue the experiment. Not unlike this feeling of weariness—yet differing from it, being something more—are the feelings which follow the concentration of the attention or consciousness on one of the limbs—say the leg,—"vague feelings of tension or tingling," or "sensations of heat and cold, hardly definite enough for description, but sufficiently so for proof."

Such cases, it has been observed, "where it is difficult to prove more than a change or increase of feeling in the parts affected, may appear ambiguous in evidence. But that some real alteration takes place, either in their nervous condition or circulation, or both, is probable from the distinct evidence of this in other instances of the mental consciousness thus locally directed."

If these phenomena are called obscure, it is an error. The explanation of them may be obscure, but they themselves are unmistakable realities. Beyond the phenomena, however, it is not our present purpose to go. They are adduced here only as a further illustration of the relations of mind to body, and of the influence the first may have over the last. Were we to attempt more, I fear we should only mortify pride and reveal no useful truth.

ARTICLE II.—*Injury to the Cervical Vertebræ.* By J. FAYRER, M.D., F.R.S.E., C.S.I.; Surgeon, Bengal Army; Professor of Surgery in the Medical College of Bengal.

ON the evening of the 12th May 1871, Mr —— brought his child, an intelligent and interesting girl of 6½ years of age, to me, with the following account of an accident that had happened to her that day about 12.30. She had been taken up by the head by a grown-up person, and so lifted on to a table. The child told her father that she felt pain, heard something snap, and found that her head was twisted to one side, and that she could not return it to its natural position. She went home at 3 P.M.; her head was then twisted to one side, she had considerable pain in the neck, and there was a bony projection at the lower part of the back of the neck on the right side, and a little above its junction with the shoulders.

The father and mother, being alarmed at the child's condition, brought her to me at about 7.30 P.M., when I found her to be in the following condition :—

She is a slight but healthy child; her father and mother and other relatives assert that there was no deformity before the accident. Her head was slightly inclined forwards, and her face twisted towards the left side.

On examining the neck and manipulating the injured part, she said she felt some pain, but it was evidently not very severe, as she allowed me to move her neck and head freely. There was a marked bony prominence, which I took to be the right lateral process of the sixth or seventh cervical vertebra. There was considerable mobility, and, considering the nature of the lesion, wonderfully little pain. The head could be rotated in either direction; considerable flexion and extension were practicable, but the distortion remained, and the prominence was unchanged. There was neither swelling nor contusion about the neck or face. The child seemed well in other respects, and bore the examination with great patience. There was no evidence of injury to the spinal cord.

There was considerable mobility, as I have said, but I could detect neither crepitation nor movement as of fractured processes in contact, neither could I, by extension of the neck and rotation, make any permanent impression on the distortion.

The absence of pain led me to suggest the possibility of some previous accident, the results of which might have been unnoticed; but the father was most positive in his assurance that such was not the case. The girl was equally positive in her statement that the injury was caused as I have described to-day. I know the child well, and believe that she had no previous deformity of the neck.

I diagnosed the injury to be dislocation of the articular process of the fifth or sixth from the sixth or seventh cervical vertebræ on the right side. I examined carefully for fracture, but beyond the fact that there was more mobility than might be expected in dislocation only, could detect none.

On the 13th May, in consultation with Professors Ewart and Cutcliffe, I again, under the influence of chloroform, made a careful examination, and after continued and careful extension of the neck, with counter-extension from the shoulders, effected a change in the position of the bones, and partially returned them to their normal position. But during the manipulation it became evident that there was not only dislocation, but fracture of the transverse process; and, after returning the parts to as nearly as possible a natural position, it was not deemed prudent to use any further interference, and the child was placed in the recumbent posture, with instructions to keep her so, and support the head on either side with a pillow stuffed with sand.

14*th May.*—She is well, and free from pain; the face has a very slight inclination to the left shoulder, but it is easily straightened. The head and neck are movable in all directions. A slight prominence can still be felt, but it disappears on rotating the head and pressing it backwards.

I directed that the child should be kept on her back, and the head and neck laterally supported, as I have described.

19*th May.*—The child is well and free from pain; a certain amount of distortion remains.

It appears that the child was lifted from the bench on which she was sitting to the table, at some feet distance; she was raised suddenly by the head, felt sharp pain, and heard a snap in her neck, as of a bone going out of place.

There can be no doubt that in this sudden and violent transport from the bench to the table, raised by the head, some sudden rotatory movement, aided by the weight of the unsupported body, caused dislocation of the articulating process of the sixth from the seventh vertical vertebra, and probably fractured the transverse process near its junction with the body of the bone.

ARTICLE III.—*Introductory Address, delivered at the Opening of the Edinburgh School of Medicine, on the* 1*st of November* 1871. By THOMAS ANNANDALE, F.R.S.E., Surgeon to the Royal Infirmary, and Lecturer on Clinical Surgery.

GENTLEMEN,—My first and pleasing duty to-day is to offer you, in the name of my colleagues, a hearty welcome to this School of Medicine. I welcome back with pleasure those of you who have been with us before. Your return is the best possible proof that you are contented with, and I trust proud of, your School and its teachers; and, therefore, your presence on this occasion is an encouragement to us to persevere in our endeavours to give you sound instruction. I ask you to continue your studies in the same excellent manner as you have hitherto done; and especially I would ask you to set an example to, and assist in every possible way, those gentlemen who to-day join us for the first time. Most of you must remember the feelings with which you first entered on the study of Medicine. How new and puzzling many things appeared, and how even despair sometimes seized you on discovering the vastness of the task you had undertaken; and yet, by the aid and encouragement of others, and by your own perseverance, these difficulties were gradually dispelled, brighter and more encouraging became the path, and you are now matured medical students. With the recollection of your own first difficulties, I again ask your best sympathies for your junior associates. By endeavouring to guide others with proper tact and aid you will benefit yourselves, earn the gratitude of your fellow-students and their friends, and bring credit to your School and its teachers. If there are any here who have neglected or been remiss in their work, I would earnestly beg them at once to endeavour to make up their lost time. Unless they begin to work now, it will become more and more difficult for them to gain the ground which they should before have possessed; and although they may in time, by a process of cramming, obtain diplomas, they can never expect to practise their profession with credit to themselves or their School, or with safety to, or the confidence of, their patients.

In giving a sincere welcome to those of you who come here for the first time, I would ask you to join our ranks with a thorough determination to work and to master the details of the profession you have chosen. If you come with this determination you will, I feel sure, receive every encouragement and assistance from us your teachers. In selecting Edinburgh as your *alma mater*, you have chosen a school second to none. The reputation of our University and Medical School is no report of yesterday. The many eminent names which have been connected with them are as enduring as the Castle Rock; and I have no hesitation in saying that their present representatives are worthy of the position they occupy. Few changes, I am glad to report, have taken place in the staff of our School since last we met; but I must refer to the retirement of one of your most respected clinical teachers. Dr Gillespie, after a long and faithful service in connexion with the Infirmary, has thought it right to retire from active service. I am sure I express the feelings of my colleagues, and of those of you who have previously attended this School, when I assure Dr Gillespie that in leaving us he has our true and well-deserved respect and esteem, and that we wish him a long and happy life to enjoy the professional and social position he occupies in this city. As a junior colleague of Dr Gillespie, I have invariably received from him the greatest kindness and courtesy; and I am glad to have this opportunity of acknowledging and sincerely thanking him for it.

In entering upon the study of Medicine, you are undertaking no easy journey, and unless you are prepared to encounter and overcome difficulties, I would use the expressive word of the immortal *Punch*, and say to you, "Don't," but rather try to discover some other occupation more congenial to your inclinations. The time allowed for your journey is some four years, and the ground you are expected to go over in this time is extensive and varied. Chemistry, Botany, Natural History, Physiology, Materia Medica, and last, but not least, Anatomy, are some of the incidents to be mastered on the way before you can properly understand the practical branches of your profession. None of these incidents are to be despised; some of them may seem unimportant and unconnected with the object of your journey, but you may be sure that they are all useful, and will prove of service to you afterwards. It is the abuse (if I may use the expression), not the use, of some of these which is a hardship to the students, and I trust that, ere long, some of them may be included in the general education of a gentleman, and their acquirement be therefore no longer a necessary part of the Medical Curriculum. The abuse of lectures and lecturing is another real hardship which you have as yet to encounter, but I sincerely hope that, in future legislation on medical education, more freedom to the student will be the rule, and that it will no longer be imperative for him to attend a large and fixed number of lectures in a session.

Lectures properly selected and moderately attended are, in my opinion, most valuable; but the incessant and continuous lecturing of the times is wearisome to the student, harassing to the teacher, and certainly not calculated to supply the best instruction. It may be truly said of the student nowadays, in the words of a Latin author—

> " He that desires this wished goal to gain,
> Must sweat and freeze before he can attain."

I would wish the student to have more time and greater facilities for study in the hospital, more time for work in the dissecting-room and practical laboratories connected with Physiology, Pathology, and Chemistry, and more tutorial assistance.

In making these remarks, it is certainly not my intention to alarm you. I only desire to make you think seriously of what is before you; and if you will work steadily and perseveringly during your student-days, I can with great confidence assure you, that success as to your examinations and the future practice of your profession will result.

Let me remind you also, gentlemen, that in joining this School you become a part of it, and that, therefore, you are bound to do everything you can to uphold its character and add to its renown. In the various classes you are required to attend you will, I have no doubt, receive advice as to the best methods of studying the particular subjects taught in them, and I will therefore content myself by offering you a few general remarks in connexion with your future studies and position as medical students. In the first place, try to acquire a regular and steady method of working, so that you may daily add to your knowledge, and gradually prepare yourselves for further and more advanced studies. Steady work of this kind will always succeed in the end. In the fable it was not the swift but careless hare that won the race, but the persevering tortoise. In order to carry out such a system of study your habits must be regular, and, above all, your health must be considered and attended to. It is not necessary for me to give you a lecture on the best way to keep your health. If you do not already know how best to do this, a little experience and observation will soon teach you what is good and what is bad; whether or not you should rise early in the morning or go to bed late at night; and the amount of knowledge you can imbibe in the twenty-four hours without injury. The only advice I have to give you on this subject is, Don't get up early in the morning and sit up late at night at the same time, for you will find this a process of burning the candle at both ends, which you know is not a healthy or desirable proceeding. Some recreation is absolutely essential. Those of you who desire active bodily exercise will find it to perfection on the Pentland Hills, Arthur Seat, and other noble walks around this city; for athletes there is the University gymnasium, an excellent institution if taken in moderation; and for those of you who have military aspirations, there is the University company of Volunteers, where, I am sure, you will receive a hearty welcome from its much-respected and veteran commander, Sir Robert Christison. Endeavour, also, to devote some of your leisure hours to the improvement of your general education by a study of literature, art, general science, and the modern languages. The mind, in order to keep healthy, requires a change of food occasionally, and you will find no better change of diet for it than such studies; while, at the same time, you will best fit yourselves for taking the position in society which members of our profession will always receive if they are worthy of it. Remember that you are not merely working to pass examinations, but that you are preparing for the future practice of your profession. It is for this latter reason that the more practical studies are of such importance, and you cannot be too diligent in the wards of the hospital, in the dissecting-room, and pathological theatre. It is not by walking through the hospital, or looking at the work going on in the dissecting-room, that you will gain practical knowledge; but you must make a careful study of disease in the former, as will be explained to you by your clinical teachers, and in the latter you must employ the scalpel and forceps with perseverance and care. Let me quote to you the following words of Dr Latham, addressed to his clinical students:—

"So, in entering this place, even this vast hospital, where there is many a significant, many a wonderful thing, you shall take me along with you, and I will be your guide. But it is by your own eyes, and your own minds, and (may I add) by your own hearts, that you must observe and learn and profit: I can only point to the subjects, and have little more to say than 'see here and see there.'"

Such work will bring you true and sound knowledge, which will be serviceable all your lifetime.

The study of Medicine is more arduous than formerly, for much more is required of the student; but, on the other hand, the facilities now afforded make his labours comparatively easy, if only he will work. Much has yet to be learned in our profession, and there are many fields of research in connexion with it which call for earnest workers. The honour of assisting in this work is open to you all, and it will, I trust, be an object of ambition—to some of you at least—to embrace such honour in the future.

If in the course of your studies your inclinations lead you to investigate some special subject, continue such investigation with perseverance, especially if the subject be one likely to afford original and new material. Although you may only be able to work at it occasionally and for short periods, you are sure in time to gain results, and such results may be most valuable as additions to our knowledge.

I know many instances where such investigations commenced in student-days, and, persevered with, have brought great reputation and credit to the worker, and have largely benefited science. The mere acquisition of knowledge or facts is not sufficient. You must learn how best to apply or use knowledge, so that it will be serviceable to you and to your patients. Cowper has truthfully described this in his *Task* :—

> " Knowledge and Wisdom, far from being one,
> Have oft-times no connexion. Knowledge dwells
> In heads replete with thoughts of other men;
> Wisdom in minds attentive to their own.
> Knowledge, a rude unprofitable mass,
> The mere materials with which wisdom builds,
> Till smoothed and squared and fitted to its place,
> Does but encumber whom it seems to enrich.
> Knowledge is proud that he has learnt so much,
> Wisdom is humble that he knows no more."

The practice of " taking notes " is a favourite topic of advice to students, and is no doubt most useful, and its results valuable, if you take notes of the right things in the right way; but do not acquire the habit of taking notes of everything, or you will on many occasions neglect opportunities of observation or demonstration which would have made a more lasting impression on your mind than any number of notes. Do not take notes of what you can read with more advantage in print, but take diligent notes of any original observations—of any subject you do not understand (in order that you may master it at your leisure); and, above all, take careful notes of all you see and hear in the hospital and pathological theatre.

An inspection of students' note-books would, I fear, not always reveal the owner's constant devotion to the subject treated of. Studies of nature as met with in the dissecting-room, sketches of professors or lecturers, various studies of the features of the girl or girls " we left behind us," and even in some instances lines of original poetry, have, if I am rightly informed, occasionally been found in the note-books of medical students. This particular mixture of the arts and sciences is not be encouraged.

Attendance at debating societies is generally also referred to in addresses such as the present. This practice is most serviceable, provided you take part in the discussions and working of the society, and at the same time study the subjects of debate. Talking for mere talking's sake can do you no good, and I know from experience that the talking on these occasions is not always to the enlightenment of the audience or the advancement of science. In fact, I have sometimes listened to debates which had much the same result as a celebrated discussion which took place in the eleventh century. The discussion was, "When a hog is carried to market with a rope tied about its neck, which rope is held at the other end by a man; whether is the hog carried to market by the rope or by the man?" This question was debated for a whole century by many learned men, but it still remains undecided. As students of this School you have the privilege of joining the Royal Medical or Hunterian Medical Societies, in either of which you will have an excellent field for practising and perfecting your powers of debating. In your debates and in the differences of opinion which will occasionally arise in regard to other matters, train yourselves to fight honourably. If your opponent is worthy of you, fight him honestly and with fair weapons; and although you may not come to an agreement, you will learn to respect one another. If he is unworthy, avoid him. Take Socrates's advice, who says, "Suppose an ass were to kick me, would it be right or becoming in me to kick him again?"

A student is at first often at a loss as to what books he should study. In regard to text-books, I would advise you to study those recommended by your various teachers, but the fewer of these books you purchase the better. A certain number of them is necessary; but if you have the means and wish to form a professional library, buy the best and standard works on the different subjects connected with Medicine, for these will always be of service to you, and a study of them will give you knowledge direct from the head source. I offer no apology for here addressing a word of warning to the young student. It is occasionally the sad experience of my colleagues and myself to observe, and be helpless to prevent, the complete disgrace and ruin of a student who has joined us with bright prospects before him, but who, instead of realizing them, has given way to temptation, neglected his work, and brought himself to misery. You will all have temptations, many of them difficult to resist. Endeavour from the first to resist them, and their power over you for evil will soon become ineffectual; but once give way to them and it will be difficult, often impossible, to escape their effects.

> "Motions to ill resist in their first grass,
> Lest, gaining growth, they shoot into the ear:
> Custom to sin at length will make you pass
> That for a bat which was before a bear."

Think of your friends at home and their anxiety for your progress and success. If you fail to do your duty, think how great will be their distress; but if you become good and successful students, how pleasant will it be to feel that you have their esteem and approbation.

As Students of Medicine, gentlemen, you have all become connected with a great profession. You are no longer simple citizens, for your connexion with the medical profession has placed you in a special position, and has devolved upon you duties which you cannot in honour neglect or despise.

I would first speak of your duties to the public. The important bond and sympathy between the public and our profession is, although sometimes ignored, now generally acknowledged and valued. Members of our profession, if they respect themselves and their profession, have a well-merited and established position. The possession of this position gives to our profession a power which is, perhaps, greater than is possessed by any other body of men, and yet I do not hesitate to say that this power is used with the greatest moderation, delicacy, and sanctity. It is, therefore, much to be regretted that many of the public have little sympathy with medical students. It would almost appear that many people take their ideas of a medical student from Dickens's characters of Messrs Bob Sawyer and Benjamin Allen, in "Pickwick," for it is too common to hear such a remark as, "What else could be expected—he is a medical student." Such wholesale condemnation on the part of the public is most unjust, and I cannot imagine why our particular students have been selected for it.

Medical students, as a body, will stand the test with any other body of young men, and are not in any way inferior in intellect, manners, or morals. There are bad students and men in every profession and society, but it is most unfair to take such men as types of the class or body to which they belong.

With all respect, I would ask from the public justice and some little forbearance for medical students, and would remind them that they will be their future medical attendants; and I would further remind them of the dangers to which medical students are exposed in the prosecution of their studies, dangers which affect no other class of students. In the last few months, two much-esteemed students of this School have lost their lives while endeavouring to relieve human distress; and how many others have similarly perished! And, gentlemen, let me urge you to try and gain the esteem of the public by your conduct. Learn to respect yourselves and your profession; and in this way prove that you are worthy of your position.

In your general intercourse with the public, avoid as much as possible special professional conversation. It is not desirable that any mystery should be made in regard to our profession—and there are times when professional explanations are very right; but there are many subjects unsuitable for conversation and discussion in general society; and I have sometimes heard it alleged that medical students are too fond of talking "shop," and making themselves disagreeable, by reference to various horrors or scenes which had come under their notice. In defence of students I must say, that not unfrequently they are encouraged in this conversation by their audience, who, with a morbid curiosity, seek to learn things which partake somewhat of the sensational. Be simple in your professional conversation, so that when it is necessary to make explanations to non-professional people, you may be able to do so in language intelligible to them.

A few years ago, when travelling in a public conveyance, a young gentleman, with a thick comforter folded round his neck, entered the carriage. As he seemed very miserable, one of the company asked him if he was ill. The young gentleman replied in words somewhat like the following:—"I am suffering from a severe attack of acute catarrh, complicated with bronchitis, and attended with copious expectoration!" If this learned gentleman wished the company to know that he was a medical student his object was certainly attained, but it would have been better taste if he had simply said he had a cold.

The intentional mystification of patients and the public by the employment of unintelligible words or expressions, is a species of humbug quite unworthy of the members of a great profession.

Be liberal-minded in the widest sense of the term; and if you wish to be happy in your future practice, avoid all tendency to what is termed gossip. Much mischief results from this practice, which is by no means confined to a certain class, as is sometimes asserted in every kind of society; but a medical man hears and sees very many things which should be sacred, and if he once gives himself to the practice referred to, he is no longer fit to be the trustworthy associate and friend of his patients.

To the patients who come under your care or observation in hospital and other practice, fulfil the golden rule, and "do to them as you would be done by." Ingratitude on their part you may sometimes meet with; but if you honestly do your duty to them, you will receive many happy and pleasing testimonies of gratitude, which will more than compensate for the former, and be a real encouragement to you to persevere in your good work.

In the second place, you will best fulfil your duty to your teachers and School by earnestly working and becoming good students. We, your teachers, hold a responsible position towards you, and you will much lighten this responsibility by trying to give us as little anxiety as possible. Do not look upon us only as your teachers, and possible future examiners; but consider that we are your friends, both willing and anxious to interest ourselves in your welfare, and teach you your profession to the best of our ability.

The conduct and success of students influences very much the reputation of the school to which they belong. Remember this, and do not let anything on your part tend to diminish the already well-earned reputation of the Edinburgh School.

Lastly, gentlemen, there are duties to yourselves and associates. I have asked the seniors among you to assist and encourage the juniors, and I now ask the juniors to respect their seniors, and cultivate their friendship and assistance. I am no advocate for the system of fagging, as it used to be carried out in some of our public schools; but I would not object to see some milder form of connexion between the senior and junior students. I would not have the juniors compelled to black the boots of the seniors in the evening, or prepare their hot toast or rolls in the morning, but I would have them place themselves under the care of the seniors (provided the latter are good students), who would teach them to work regularly and profitably, and would at the same time keep them out of serious mischief.

You are all working for the same end, and it should be your endeavour to work together in good-fellowship; and do, gentlemen, try so to train and educate your actions and feelings now, that in the future you may assist in banishing the reproach that the members of our profession are too much given to strife with one another.

In conclusion, let me remind you, in the beautiful words of Longfellow, that

> "Life is real, life is earnest,
> And the grave is not its goal:
> Dust thou art, to dust returnest,
> Was not spoken of the soul."

ARTICLE IV.—*A Cause of Heart Disease in the Army.* By FRANCIS W. MOINET, M.D.

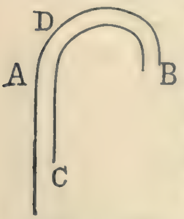
IN studying cases of heart disease, we frequently meet with some in which the lesions are so serious as to indicate themselves by symptoms which the merest tyro in diagnosis could hardly fail to appreciate, but which puzzle us on account of our inability to detect the cause—at least, a satisfactory one; for instance, in many cases of hypertrophy of the heart, dilatation and aneurism of the aorta, we console ourselves by attributing them to diseases of the arterial coats, Bright's disease, etc.; and although not for a moment do we lightly consider the grave effects which may result on the organ of circulation from these causes, we feel that they do not, in a conclusive manner, prove themselves to be the first causes in all cases—some, perhaps, not showing the faintest connexion between cause and effect, although, no doubt, they may aggravate or accelerate these pathological conditions.

It was this feeling which, after the perusal of Mr Myers's essay on Diseases of the Heart among Soldiers, led us to examine somewhat minutely the anatomy of the organs of circulation, in the hope of thereby satisfying ourselves as to the correctness of a theory which seemed to us to offer an explanation of these cases more reasonable than any we are acquainted with.

In works on anatomy, the heart is described as being contained in a bag called the pericardium. Now, if we examine its connexions to this bag, we find that it is only attached and held in position at its upper extremity by the large bloodvessels and the reflexion of the pericardium; so that the heart is always more or less suspended by these attachments in the pericardium when the body is in any position but the recumbent.

From this we see that the aorta has attached to it at the commencement of its ascending portion a weight, which, according to Reid's investigations, varies from about 8 to 10 oz. in the female, and from 10 to 12 oz. in the male. This weight will naturally be increased to some extent by the amount of blood contained in the organ when it is in action, and by the recoil after each contraction of the ventricles.

Then, if we look at the aorta, which takes the form of an arch, with this weight attached to one extremity, we will see that this mechanical arrangement places it under certain disadvantages in peculiar circumstances; for although, by Nature's wise provision, any slight change which might result in the curve of the aorta by its being drawn down by the weight of the heart is probably compensated for by the time we require for sleep allowing the vessel to regain its elasticity, still we must perceive that any circumstance acting so as to increase this weight must necessarily entail very serious consequences on the arch of the aorta. For instance, take A B as the arch of the aorta, and C the weight or heart attached, we find that the weight C will tend to diminish the radius of the arch, and render the angle of the curve more acute, thus increasing the opposition to the current of the blood, especially at the curve D. What will happen then? Hypertrophy of left ventricle, dilatation of the aorta behind the point of obstruction D, affections of the aortic valves, and the risk of aneurism of the aorta at the commencement of the arch will be increased, thus entailing a series of very grave results.



First, as to the position of the heart: it hangs obliquely—simply due to its point of attachment, and not because of receiving support at any other point besides that.

Does the diaphragm assist in its support? Very little if any; because in every inspiration it descends, while the heart is raised; so that, during inspiration at least, it has no part in its support, and little, if any, during expiration, because it is the side of the ventricle which comes in contact with the diaphragm, which, being lax, will yield before the heart's weight, thus affording it only a nominal support, for, except in the case of children, the diaphragm is more a muscle of inspiration than of expiration. Again, the greatest amount of exertion is always made during inspiration, so that the heart is more freely suspended then than at any other time. If we now examine the pulse, we will obtain from it proofs that in certain positions of the body the heart has less support than in others. Graves, I think, was the first to point out the difference in the pulse in the erect, semi-erect, and recumbent positions. It is most frequent in the erect position—the difference being from six to fifteen beats in the minute—from which he deduced the conclusion that the maximum of strength and the minimum of frequency are attained together; and he applies this fact to the explanation of the relief produced by the horizontal position in syncope. To account for this, the heart must be either placed in a more favourable position for carrying on its work, or the demand for its work is diminished; or, what is still more probable, it is a combination of both these conditions which renders the strength of the pulse greater and its rapidity less in the horizontal position than in the erect. First, let us consider how the position of the heart has anything to do with this fact. In the erect position it is, as we have already said, suspended, receiving only protection and facility of movement from the pericardium, but no persistent support at any part; while, in the horizontal position, the heart lies on the pericardium and lung, which gives it a *point d'appui* for its action, and enables it to act with greater force; this partial support is the only one useful and free from danger, because, if it exceeded this, the action of the heart would be interfered with; but in this case the small amount of interference with its action is more than compensated by the purchase it gets during each contraction from this point of resistance. Second, the other cause at work is, that the waste of tissues is less in the recumbent position, the whole muscular system being in as complete a state of rest as is possible; hence the work of repair does not require to be so much hurried. Third, the heart is also relieved in the horizontal position, from the fact that the mere weight of the column of blood in the ascending aorta and vessels of the head and neck has not to be overcome, the force required to propel the blood perpendicularly upwards being necessarily greater than that required to propel it on a level; this also relieves its work.

Thus, we see that, in the erect position, the heart and aorta are placed under certain disadvantageous circumstances. The heart has to overcome during each contraction the weight of the column of blood in the ascending aorta, and so requires to act with more strength. Still more so, if exercise is taken in that position, especially exercise of the upper extremities; at the same time, the arch of the aorta is exposed to the risk of having its curve made more acute by the weight of the suspended heart; and, the force of the current of blood being increased, it acts all the more speedily at the point of obstruction, viz., the angle D; so that certain external circumstances, taken in conjunction with this mechanical arrangement of the heart and aorta, come to be considered as important causes of disease of the organs of circulation. Starting from this point—that the erect position places the heart and aorta in circumstances favourable for the development of certain serious lesions—we will examine and see under what conditions the risk of the formation of these lesions is increased.

First, of a certainty, comes long-continued maintenance in that position, especially if constrained by rule or dress. Secondly, exercise of the upper extremities while in that position; and it is because these two unfavourable conditions are so prominently met with in our foot regiments, that we have headed this paper A Cause of Heart Disease in the Army.

All physical exercise increases the rapidity of the circulation, as the part exercised, or in which the greatest waste of tissue is taking place, of necessity requires an increased supply of blood to repair that waste. Hence, in using the arms in the erect position, if indulged in to too great an extent, the heart is stimulated to increased work under adverse circumstances, the curve of the aorta being rendered more acute by the heart's weight offering increased resistance at the point D, and the heart acting with greater rapidity keeps up the strain at that point more continuously; so that it tends gradually but surely to weaken the elasticity of the middle coat, and renders the angle at D more acute, which, when it happens, causes dilatation behind that point, etc.; and so much the more surely and speedily does this train of evils follow if the aorta is in the least degree affected with atheroma, which not only hastens these evils, but, as may easily be conceived, adds aneurism as another very probable result, as occurring at the point D, where the force of the blood is most directly received. Not only is the strain on the heart increased by the necessity for more work, but, at the same time, a mechanical obstruction to the flow of blood is caused by this arrangement of the parts when it is kept up too long; and this danger is augmented, we believe, by the constriction caused by the soldier's accoutrements, as Mr Myers has shown in his essay; but that this constriction due to the uniform should be the sole cause of the prevalence of heart disease in the army cannot be admitted.

Mr Myers has shown, from his careful examination of cases of incipient heart disease in the army, that the first lesion distinguishable is hypertrophy, which is just what we would expect from our theory of its cause, dilatation of the aorta probably occurring at a later date — at least, it is not so easily diagnosed in its earliest stage as hypertrophy. This cause of heart disease is of course at work in others besides in soldiers—as in our labouring population, etc.—only we have not in them the same opportunities of watching the gradual occurrence of the symptoms of these affections in their earlier stages, many not seeking relief until almost *in extremis*, and then we have to content ourselves with noticing the existing changes, as we can gain little reliable information as to the origin of their maladies; but in the army, where these changes have been carefully watched and studied from their very beginning by Mr Myers, we have more confidence in speaking of them; so that his careful observations have the more weight as they directly bear on the point in question, and, as he made them in support of his theory, cannot, when applied to ours, be accused of any partiality.

If our theory is correct, we should expect to find that the cardiac lesions most frequently met with among soldiers are disease of the aortic valve, aneurism, especially of the ascending aorta and arch, and also we would expect that these lesions occur more frequently in the army than in the civil population in proportion to the number of cases of heart disease. The diseases of the heart most common in the army, according to Mr Myers, are hypertrophy, aneurism, and disease of the aortic valves; for, from post-mortem records which he made at Netley, he found that in 97 cases valvular lesions occurred as follows:—Of aortic valvular disease, 50; mitral, 25; mitral and aortic, 22. He then quotes the "British and Foreign Medico-Chirurgical Review," vol. xiv., as showing the comparative frequency of these valvular lesions in civil practice. Total number of cases, 673: aortic valvular disease, 192; mitral valvular disease, 205; aortic and mitral valvular disease, 259.

From this we see that, in the cases taken from civil practice, the majority have both sets of valves affected, and that the mitral alone are more frequently attacked than the aortic, showing that aortic valvular disease is at least more common in the army than in the civil population. This is explained by the strain upon the left ventricle, from the long-continued and frequently-repeated exercise with the rifle rendering the aortic valve more liable to be affected, and also by the dilatation of the aorta behind the point of obstruction at the angle D tending to make them incompetent. Next in order we would expect that aneurism of the aorta would have a prominent position as one of the diseases of the circulatory system in the soldier, and so we find it is; and from what we have said of the mechanical arrangement of the parts, we would naturally expect to find the arch the part most subject to aneurism, and next in point of frequency the ascending portion of the aorta.

"Dr Sibson, in his 'Medical Anatomy,' records 703 cases of aortic aneurism, of which 420 involved some portion of the ascending aorta; and he concludes that these tumours most frequently arise from the part of the vessel against which the greatest force of the blood is directed. Now, if this view be correct, and if it is true that the circulation of the soldier is more subject to mechanical obstruction than that of the civilian, then the site of the disease in the soldier should especially corroborate the result of Dr Sibson's investigations; and that it does so the following statistics prove:—Of 109 cases of aneurism of the aorta, there were, of the ascending aorta, 37;

arch, 38; descending aorta, 12; thoracic aorta, 7; abdominal aorta, 15.

"These cases have been abstracted from the post-mortem and museum records of Netley Hospital, care having been taken to exclude some which were not of soldiers, and from the post-mortem records of my own regiment since 1861."

From these cases we see that our inference was correct, and that a large majority of them were due to the lesions of the first two portions of the aorta. This special prevalence of aneurism in these two portions of the aorta had been noticed more than once, as Mr Myers states—first by Dr Hunter, 2d Queen's, on the Cause of Heart and Aortic Disease in the Army, which he published in 1836 in the first volume of the "Transactions of the Medical and Physical Society of Bombay;" then, again, in 1867, Staff-Surgeon Hyde published the report of a case of aortic aneurism (*vide* "Army Medical Report, 1867"), to which he appended the following remarks:—"The absence of atheroma in the coats deserves notice. It will probably be evolved, as these cases are more observed, that numerous instances of aortic aneurism in the army are unconnected with any special pre-existing structural degeneration of the arterial system; that they frequently commence under strains, as sacculated projecting pouches of the entire vascular coating." This case is of great importance, because it is held at the present day by many pathologists that there is no case of aneurism of the aorta without disease of the arterial coats in the first instance—*i.e.*, excepting a dissecting aneurism—and perhaps this opinion might hold good were the arch under all circumstances to retain its original curve; but when, as we have shown, it is frequently exposed—especially in the army—to influences which tend gradually to render the angle of the curve more acute, we are not so surprised at the absence of atheroma, as we have sufficient to account for their formation without falling back upon it; so that, placing atheroma and hypertrophy out of the question, as not being of themselves sufficient to account for the production of the lesion, the only other possible agent in its formation is some obstruction to the flow of blood at that point of the aorta—an obstruction the nature of which we have already described. There is another fact which throws some doubt upon the idea that atheroma is almost the sole cause of aneurism of the aorta, that, in the army, cases of aneurism are met with at a much earlier age than in the civil population, and in some at an age when atheroma is very rarely found; and certainly there is no reason why atheroma should occur at an earlier period in the soldier than in the civilian. Hence, all the results of Mr Myers's investigations tend to confirm the soundness of our theory, first, as regards the nature of the lesions which it entails, and secondly, as regards their comparative frequency.

We have already stated that these serious lesions are induced by the long-continued exertions made during drill by carrying the rifle and going through the musketry exercise, the body being, for the most part of the time, in the erect position.

How do we propose to remedy this? It is very simply done—by diminishing the amount of rifle exercise; and this could easily be managed without interfering with the efficiency and regularity of the movements which are the pride of the drill-sergeants and officers. The rifle-drill, *per se*, is not difficult to master; and when once thoroughly mastered, is not easily forgotten. We would propose that company and battalion drill should be done for the most part without the rifle; and although it might not look so military or imposing, when we put on the one side appearance and on the other the danger of heart disease, no one will, I hope, fail to see the necessity of yielding to the latter.

All these drills could thus be done, with an occasional exception, as that of an inspection or field-day; and we would venture to say that, on these days of extra exertion, the men would go through them better, and with less fatigue or risk of after injury to their circulatory organs, than according to the present system. When we consider how small our army is compared with other armies, we have the more reason to keep them in as sound and active a condition as possible. It would also prevent a great loss of men from invaliding, and thus would be more economical both of men and money.

Considering these many advantages that would be gained by adopting this method, we think it is an innovation which would more than amply repay its introduction, by rendering the men a stronger body, more able to undergo any prolonged exertion, and giving to the officers a better body of men to command.

ARTICLE V. — *Case of Hæmatemesis treated by the Hypodermic Injection of Ergotine.* By CHARLES STEWART, M.B. Edin., etc., Denny.

J. M., aged 28, housemaid in a gentleman's family, was seized at 4.30 A.M. of 15th October 1871 with vomiting of blood. I saw her at 5 A.M., and found she had vomited rather more than a pint and a half of blood, quite pure, semi-coagulated, of dark colour, and closely resembling a quantity of black currant jelly.

The patient was a stout woman, and, when well, of a florid complexion and general healthy appearance. When I arrived, I found her in bed, very pale, with a thready pulse of 108, much alarmed, of course, and complaining of great faintness and a feeling of sickness. Beside the bed was the wash-hand basin containing the blood. She felt no pain anywhere, but the stomach was a little tender on pressure, though no epigastric tumour of any sort could be detected. The lungs were healthy, and there was not, nor ever had been, the slightest tendency to cough. The heart and the dimensions of the liver and spleen were carefully examined, but nothing unnatural was found. The urine was non-coagulable. The catamenia were regular, and the last monthly discharge had occurred in its usual time and quantity two days previously. On questioning her closely, I ascertained that five years ago she had suffered from a similar attack in Edinburgh, when her life was considered in great danger. Previous to that attack she had suffered from symptoms which were called "indigestion." For a few months past she has experienced pain in the stomach, shooting through to the middle of the back, relieved for a time on taking food, but returning shortly afterwards, often so severely as to occasion sickness, and sometimes vomiting. Like most domestic servants, she has been in the habit of using strong tea largely as an article of all her meals.

From the antecedent history of this patient, and from the dyspeptic symptoms that had of late been troubling her, combined with the fact of the absence of any other apparent cause, I was led to believe that the hæmorrhage was due to gastric ulceration. From the great pallor of the surface, coldness of the hands and feet, thready pulse, and continued faintness, I inferred that hæmorrhage was still going on into the stomach; and from the profuseness of the bleeding already demonstrated, I was disposed to take a very gloomy view of the case.

I directed that she should be kept cool, abstain from every sort of food, and take fifteen drops of oil of turpentine in cold water every hour, and suck ice continually.

At 10.30 A.M. I was again called. She had thrown just one mouthful of very black blood since my early visit; but the bowels had acted once, and a large quantity of a tarry-looking fluid had been passed. She felt very sick and faint, and the pulse was still small and rapid. She was taking the ice and turpentine. I ordered her to have a dessertspoonful of brandy in iced water occasionally.

9.30 P.M.—Was called to her again. Found that she had vomited more than a pint of very pure blood, and was in a condition bordering on syncope. I administered a stimulant, put some pounded ice in a bladder and applied it to the epigastrium, and then injected about grs. iii. of ergotine in solution in water with a small proportion of spirit, beneath the skin covering the deltoid muscle of the left arm. The operation caused but trifling pain. It produced a dark-coloured stain shining through the skin around the puncture of the syringe. I fastened a small linen pad over the spot.

16*th October*, 11 A.M.—No bleeding has occurred since the injection. During the night the bowels were moved, the stool being dark-coloured as before. After a dose of turpentine, she retched, and threw up about a spoonful of matter like coffee-grounds.

Since then she has felt better. The skin is hot and dry; the pulse 120, and wiry; the head aches, the tongue is slightly furred. She passed a restless night, and is now suffering from a reactionary pyrexia. The puncture of the skin on the left arm is quite distinct, but the dark coloration around is quite gone, and neither pain nor any inflammation are present in the part.

Ice and brandy to be continued, but turpentine stopped. To have the ice-poultice occasionally applied to the stomach, and to be fed with small quantities of calves-foot jelly and cold arrow-root.

17*th*.—At 10 A.M. she was sick, and threw up about an ounce of transparent water tinged with blood. Pulse, 104, increased in power. Though there is no inclination for food, she feels as though she would relish "something salt." To have small quantities of good beef-tea, well strained and cold.

18*th*.—Pulse, 88; feels stronger. To have a drachm of castor-oil every four hours till the bowels are gently acted on.

From this date forward she continued steadily to recover, under a very carefully-regulated diet.

Lately, the dyspeptic symptoms having again shown themselves, she was put on ¼ gr. of nitrate of silver three times a day for a week, and has since been taking a mixture of calumba and gentian. She is still weak.

I think this case demonstrates very forcibly the great power of the hypodermic use of ergotine in arresting vascular hæmorrhage. Here, the most powerful remedies we possess for hæmatemesis (and I do not speak without a little experience) were employed in vain, viz., ice and turpentine. Dr Begbie did not give the ol. terebinthinæ more praise than it deserves, in his very able paper; but it failed here, even when combined with its still more potent ally, ice. But as soon as the ergotine was introduced directly into the circulation, the hæmorrhage at once, and I think I may say entirely, ceased. I have seen its power in epistaxis, but as yet have never had to employ it in hæmoptysis. A profuse case of the latter, which lately occurred in my practice, threatened to require the operation, but was checked, after much loss of blood, by ice, and a mixture of sulphuric acid and tincture of arnica.

[*Note.*—With so efficacious a remedy always at hand or readily procurable, why wait in any suitable case the uncertain action of slow and doubtful remedies?—ED. *E. M. J.*]

ARTICLE VI.—*Chlorine Water in the Treatment of Diphtheria.* By W. G. BALFOUR, L.R.C.S.E., Assistant Medical Officer to the Montrose Royal Asylum.

CHLORINE water is used by many practitioners in the treatment of scarlet fever. In the *Medical Times and Gazette* of the 25th August

1829, there is a letter by Messrs Taynton and Wells, stating that they employed chlorine water in cases of scarlet fever, and they "most solemnly declare that it proved successful in almost every case to which they were called in time, and in which the medicine was *faithfully* administered." At page 209 of Watson's *Practice of Physic*, vol. ii. (fourth edition), mention is made of this letter in the *Medical Times and Gazette;* and the good effect of chlorine water is there stated to depend upon its disinfecting properties, probably depriving the secretions from the throat in scarlet fever of their noxious qualities.[1]

Dr Matthew Gairdner of Crieff was, as far as I know, the first to use chlorine water in diphtheria, with the best results; and it was while acting as his assistant that I became aware of its good effects.

The following observations are made with the hope that an extended trial of the chlorine solution in diphtheria may establish its value in that disease:—

In a family in the neighbourhood of Crieff, four of the children suffered from well-marked diphtheritic sore throat. In all of them the tonsils and pharynx presented patches of diphtheritic membrane, the submaxillary glands were enlarged, and the urine in two of the cases contained albumen. They were all treated with chlorine water, stimulants, and milk. Three of the children recovered, the fourth died. Dr Omond saw the child that died along with me, and confirmed my opinion as to the nature of the disease. I attributed this death to the fact that the mother failed to *faithfully* administer the medicine, assigning afterwards as her reason that it made "the poor thing cry."

The conclusion that the want of the medicine was the cause of the child's death may have been wrong; but seeing those who took it all recovered, and that their symptoms at the beginning were fully as severe as those of the child that died, it is probable.

The following severe case of diphtheria, met with recently, appears strongly to confirm the good effects I formerly obtained in the treatment of this disease by chlorine in solution:—

B. W., a child three years of age, complained one morning of a sore throat, and on examination there was seen a deposit of false membrane, the size of a threepenny-piece, on the right tonsil. Diphtheria prevailed in the neighbourhood, and although there was no proof of contagion, I had strong suspicions that it was a case of diphtheria. A solution of potas. chlor. in water was given. Next day there was a further deposit of false membrane and marked constitutional symptoms.

The breathing was short, gasping, and difficult; the pulse 130 per minute, and the urine albuminous: a teaspoonful vin. ipecac. afforded temporary relief to the breathing; but in three hours after the administration of the emetic, the symptoms again becoming urgent, recourse was had to the chlorine solution in ʒii. doses every two hours.

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[1] To prepare chlorine water, put grs. viii. of potas. chlor. in a strong pint bottle, add ʒi. of acid hydrochlor. fort.; close the mouth of the bottle whilst the violent action lasts, then add water, ounce by ounce, with constant agitation, till the bottle is full. (An adult may use the whole pint in a day.)

Next day the symptoms were if anything more intense than before, the urine highly albuminous; all solid food was refused; milk and wine in small quantities and the chlorine solution were, however, still taken.

By the evening the child was breathing in gasps, and evidently fast sinking. Hot fomentations were applied to the throat and chest, more with the object of doing something than from any hope of good resulting. Shortly after the application to the throat the child had a paroxysm of coughing, followed by a profuse expectoration of something, which was swallowed (probably the false membrane, as there was immediate relief to the breathing).

The child steadily improved after this, the chlorine being continued for several days.

A week after convalescence was established, the child choked whilst drinking some water, part of the fluid being ejected through the nostrils. This choking occurred at times for several weeks after convalescence was established, and there was also aphonia.

Other cases of diphtheria, treated in exactly the same way whilst under Dr Gairdner of Crieff, might be published. The one I have given is in itself so typical, and its termination so satisfactory, that any addition would be superfluous for the purpose in view, viz., that of calling the attention of the profession to the value of chlorine in diphtheria.

The remedial action of chlorine in diphtheria and scarlet fever appears to be more general than local. It cannot exert much influence on the exudations, which are too often in the larynx and trachea, and consequently beyond its reach when the medicine is taken in solution.

Chlorine in solution, when taken internally, is absorbed as chlorine into the blood; in poisonous doses producing decomposition of the blood-corpuscles and hypochlorite of soda. If, then, diphtheria be a disease due to toxemia, it seems highly probable that chlorine being absorbed into the blood, even in small quantities, can hardly fail to affect the poison present in the system in some way.

The case given seems strongly to support this view, for it will be observed that before the chlorine was administered, the constitutional and local symptoms were so severe as to lead to a prognosis the reverse of favourable.

There was evidently a large deposit of false membrane in the trachea and larynx, and until this was got rid of by a fit of coughing, death from suffocation was imminent.

There was no fresh deposit of membrane after the coughing, but whether due to the chlorine or not others must judge.

Whatever be the theory of the action of chlorine in cases of diphtheria, I have not found it fail in the treatment of this disease, when faithfully given, since Dr Gairdner called my attention to it, and I trust others may be induced to try it with equally favourable results.

ARTICLE VII.—*On Feigned Diseases, their Detection and Management.*

By GEORGE WILSON, M.A., M.B., C.M.; Medical Officer H.M. Convict Prison, Portsmouth; late Medical Officer H.M. Female Prison, Woking; and Assistant-Surgeon H.M. Invalid Prison, Woking.

(*Continued from page* 403.)

IN discussing further the different varieties of feigned diseases, it will be convenient to classify them as follows:—

I. Feigned and factitious diseases of the circulatory system.
II. " " respiratory "
III. " " digestive "
IV. " " urinary "
V. " " generative "
VI. " " locomotive "
VII. " " integumentary "

I. Feigned disorders of the circulatory system are comparatively rare. I have met with a few cases, in which convicts, preparatory to the hospital visit, if treated in separate cells, have accelerated the pulse and produced profuse perspiration by covering their heads over with the bed-clothes and breathing rapidly for some time. If the tongue has been previously coated with whiting from the walls—a practice not at all uncommon—such cases may be mistaken for febricula; but their real nature is easily ascertained by visiting them at an unusual hour.

Palpitation and irregularity of the heart's action have sometimes been induced by taking doses of the veratrum album or white hellebore; and, according to Gavin, so widespread was this practice at one period amongst the Royal Marines, that many were invalided before it was detected. The dose was about ten or twelve grains, and was repeated until symptoms of a somewhat grave nature set in—such as incessant vomiting, frequent tremors, clammy sweats, weak and irregular pulse, followed by violent and interrupted action of the heart. In like manner, the heart's action has been intentionally lowered and seriously disturbed by over-dosing with digitalis, tartar emetic, tobacco, etc.

While a state of syncope is often feigned by hysterical females, mendicants, and others, it is next to impossible to simulate its characteristic symptoms, and hence detection is easy. Indeed, in almost all cases of induced or simulated disorders of the circulatory system, a careful examination with the stethoscope, after the patient has been allowed to remain quiet for some time, will make clear their character; and when drugging is suspected, it is requisite that the patient be kept so far secluded as to prevent him from obtaining any further supply.

II. The symptoms of diseases of the respiratory system most commonly feigned are, pain in the chest, cough, hæmoptysis, dyspnœa, and aphonia. With regard to the first of these, it is important to bear in mind that it often exists independently of any lung affection, and may be of considerable severity. For example, it may be purely muscular—as in the case of persons who are accustomed to work at low benches or desks; or it may be sympathetic, as in some forms of dyspepsia. In the former case, it is generally well localized; and in the latter, though of a dull, undefined character, it constitutes one of a group of other symptoms, which need leave no doubt as to its genuineness. When it is feigned, on the other hand, it is usually represented to be "all over the front of the chest," and the malingerer will either be unable to describe its character, or will readily acknowledge that it corresponds to any incongruous description that may be suggested to him. If the pain be described as sharp and "catching" on a deep inspiration, and confined to a particular spot—if, too, the manner of the patient accords with his statement—it always ought to be treated as genuine, even though no stethoscopic signs of commencing pleurisy or other lung disease be detected. In subacute attacks of pleurisy, there is no doubt that special auscultatory phenomena are often absent, while the pain may be so severe as to interrupt the respiratory rhythm.

As a rule, feigned pain in the chest is accompanied by feigned cough. This latter, when listened to, gives one the idea of studied effort, and is of a dry, barking, blowing character. As might be expected, it never disturbs the patient's rest—and, indeed, is only troublesome to him when he can make it troublesome to others—it being found that he has no fit of coughing so long as he believes he is not heard. Any expectoration that may be kept for inspection consists chiefly of saliva mixed with a little clean mucus; though I have seen a few instances in which expectorated matter has been freely purloined from the spittoon of a patient in the same ward suffering from phthisis or chronic bronchitis, and represented as the schemer's own. Sometimes, however, the cough is associated with hæmoptysis; and, when this is the case, the contents of the pot or spittoon are of a dark, thin, treacly appearance, and of a somewhat ropy consistence, owing to the admixture of mucus and saliva with the blood. There is an absence of air-vesicles and of the floridness to be observed in acute attacks of hæmoptysis; there is no tendency to coagulation, nor are there any of the spots or streaks of blood in the sputa, so characteristic of genuine slight attacks. The blood in these cases is generally obtained by sucking the gums or biting the tongue, and if the patient is expectorating it when visited, the bleeding part can usually be seen. But more frequently the patient complains that he has a bad cough, and *has been* spitting up blood, in which case it is only necessary to examine the mouth, and afterwards ask him to cough and expectorate, to establish the suspicious character of his complaint. A careful examination with the stethoscope will confirm the diagnosis. If the blood shown in the spittoon be of considerable quantity and coagulated, the probability is that it has been derived from one or both nostrils, when traces of blood will be found on the mucous membrane of the nose, and very often on the tip of the forefinger of the right hand, the nail of which has been used to produce the bleeding. Cases have been recorded of hæmoptysis having been feigned by inserting foreign substances into the mouth, such as carmine, brick-dust, vermilion, etc., but none such have come under my notice.

When dyspnœa is feigned, the malingerer calls it an attack of asthma; and I have seen several instances in which the attitude of an asthmatic patient and his laboured breathing have been very well imitated. It is effected by a voluntary constriction or temporary closure of the glottis. The breathing has a wheezing, stridulous sound (somewhat resembling that of laryngismus stridulus), which is also heard more or less distinctly along with the respiratory murmur when the ear is applied to the chest. In real asthma, on the other hand, there is an absence, or marked diminution, of breath-sound on auscultation; while the evident distress pictured on the countenance of the patient cannot well be simulated.

Aphonia is very rarely feigned in prison, because nothing is to be gained by it. A suspected case could be detected by putting the patient partially under the influence of chloroform, and a speedy cure effected by mopping out the larynx with a solution of nitrate of silver, or by having recourse to the galvanic battery. I have only seen two cases amongst convicts; but I did not consider any interference necessary, on the grounds that the quieter a prisoner is, so much the better for himself and all who have got anything to do with him. When aphonia occurs amongst females, it is often of a hysterical nature, but yields readily to galvanic or electric treatment.

In discriminating between real and feigned chest symptoms, it is always advisable to satisfy oneself by auscultation and percussion concerning the state of the lungs, otherwise mistakes might occasionally be made. When feigned hæmoptysis is suspected, the patient should be made to expectorate first, to find out whether the blood proceeds from the mouth, and afterwards to cough and expectorate. Doubtful cases should be treated as genuine, or put under observation; but when the case is clear, the malingerer may either be told so, and dismissed as a humbug, or some distasteful, yet legitimate, course of treatment may be pursued. For example, if pain and cough are feigned, a warm turpentine stupe and an emetic will in all likelihood produce a rapid cure, while low diet is found to be very efficacious in checking hæmoptysis. When children make too much of a cough or cold, as they often do, a mustard poultice is a suitable remedy.

III. Disorders of the digestive system may be either feigned or induced. Vomiting, diarrhœa, dyspepsia, stomachic pain, distention of the abdomen, prolapsus ani, hæmorrhoids or bleeding from the rectum, have all been more or less successfully feigned or purposely excited; and it must be owned, that some cases of this class are attended with more than ordinary difficulty in the way of detection and management. With regard to vomiting, this difficulty becomes at times very considerable; for while, on the one hand, it is easily simulated, and, by a little practice, can be excited without effort, on the other hand, it may be the only prominent symptom of a disordered state of health, and may resist treatment for some time. It is generally admitted, for example, that it does not always depend upon gastric irritation—that, in fact, it is often associated with a depressed state of the system or nervous irritability, and may be unaccompanied by other signs of derangement affecting the pulse, tongue, the appearance of the patient, or the matter vomited. Moreover, if the persistency sometimes evinced in this variety of malingering is apt to allay suspicions, the protracted nature of genuine cases resisting for weeks and weeks every species of treatment is, in like manner, calculated to arouse them. I have seen a few instances of such extreme emaciation brought about by constantly vomiting the greater portion of the food, that one might readily have inferred that the malingerers were suffering from serious disease. I have also had one case under my care which, for some time, I could not help regarding with suspicion, but which afterwards turned out to be one of thickening and stricture of the pylorus, a form of disease occasionally met with amongst hard drinkers.

Vomiting is sometimes excited by tickling the fauces; but amongst convicts this practice can only be had recourse to on rare occasions, because it is sure to be detected. It is usually effected by pressure on the gastric region, or by voluntary contraction of the recti muscles, and is sometimes aided by swallowing air, thereby producing over-distention of the stomach. In the army it has been induced by emetics, by swallowing tobacco-juice, urine, and bullocks' blood (so as to feign hæmatemesis); and rare cases have been recorded of its having been associated with the swallowing of excrement and other abominations. When no foreign substances have been taken, the vomited matter, if ejected shortly after a meal, as is generally the case, consists of the food in an undigested state. It is free from the ropy mucus so often seen in chronic diseases of the stomach, and it is unmixed with blood, giving it the grumous or coffee-ground appearance of the *ejecta* in cases of ulcer or malignant disease. It will also be found that the patient is always very careful to have something in his pot ready for inspection at the hospital visit, and that he seldom or never admits of any improvement or amelioration of his symptoms. Speaking from my own experience, I would say that microscopic examination fails to detect any *sarcinæ ventriculi* in the vomited matter; but this is of minor importance, and need not be insisted on. There is another point, however, of some diagnostic value, and it is this: that if stimulants be given in the intervals between meals by way of experiment, the patient not only retains them on his stomach, although he rejects liquid food of every other description, but states that they do him far more good than anything else. Furthermore, the vomiting is more apt to occur after the meal preceding the visit than at other times.

The treatment which I have found to be most successful in recent cases, and when the patient is in tolerably fair condition, is at once to put him on low diet; assuring him at the same time that so soon as the vomiting ceases he will get more food, but if it continues, that it will be lessened, and that he must be fed *per rectum.* When the patient is received in an emaciated condition, care should be taken that liquid food, such as milk and beef-tea, should be given in small quantities and at short inervals, and that the patient should constantly keep the recumbent position. This latter is an important point, because I feel convinced, from cases which have come under my own observation, that voluntary vomiting cannot be readily accomplished unless the patient can suddenly bend and jerk the upper part of the body over the edge of the bed at the moment when the diaphragm is depressed, and the recti muscles contracted, to aid in the act. In persistent cases nutrient enemata should be administered with the œsophageal tube, and the tube retained in the rectum for some considerable time after its introduction, to prevent the return of the enema. It will be seen from these remarks that the course of treatment recommended differs but little from what would be pursued in obstinate vomiting arising from actual disease, such as ulcer of the stomach; and, on this account, it cannot be stigmatized as harsh or unjustifiable, even when employed in doubtful cases.

Concerning diarrhœa of a feigned or factitious nature, brief notice will suffice, although such cases are of almost daily occurrence in prison practice. It is so easy for a prisoner to say that he is suffering from this complaint, and so difficult to tell whether he is or not, without putting him under observation, that I have no doubt many receive treatment amongst the casual sick who are really scheming. This, however, is a matter of small moment, and cannot well be prevented. It is only when the prisoner throws up work on account of his suffering from diarrhœa, or when he keeps complaining for two or three consecutive occasions, that steps should be taken to test the validity of his statements. Of course, if he looks ill, his case is treated as a *bona fide* one, and he need not be subjected to such close scrutiny. But if he presents no other symptoms of deranged health beyond the diarrhœa which, as he alleges, incapacitates him for work, or of which he is constantly complaining, he should at once be put under strict observation, which consists in his being obliged to use a close-stool, in the presence of a warder, when he requires it, and not allowed to go to the water-closet. This close observation is necessary, because a malingerer will have no hesitation in breaking up his fæces and mixing them with his urine so as to imitate a liquid stool, if he be not watched; indeed, several such cases have come under my own personal knowledge. Should it now turn out that there is no diarrhœa, the prisoner is reported, and gets punished; if, however, it be found that he is suffering from diarrhœa, the question arises as to whether it has been induced, or whether it be of such severity as to necessitate his admission into hospital. The former suspicion often crosses the mind of the prison surgeon, because he is well aware that pills made of ordinary soap are at times freely partaken of to excite diarrhœa; but as it is impossible, even in suspicious cases, to assure oneself that such pills have been swallowed, it is advisable to treat the complaint as genuine, if it be of any severity—that is, by spoon or liquid diet, given cold, and in small quantities at a time. If the diarrhœa be factitious it soon ceases, because the malingerer speedily tires of this diet; and, on the other hand, if it be real, such diet is best suited to promote the patient's recovery. In like manner, an emetic is found to be very efficacious and suitable in some cases, inasmuch as it constitutes a valuable remedy in the treatment of the real disease. For ordinary cases, whether they be genuine or not, occurring amongst the casual sick, I have found the following plan of treatment work very satisfactorily:—If the tongue be coated, I order a dose of a mixture consisting of ol. ricini, vin. op., mucilag., and aq. menth. pip.; when it is clean, and no pain complained of, a dose of an acid astringent mixture is given; while if pain be complained of, though the tongue be clean, a dose of carminative mixture containing chalk is administered. In order to be able to prescribe with advantage, and to prevent scheming in hospital, the stools of diarrhœa patients should always be kept for inspection.

Feigned dyspepsia, and feigned stomachic pain, may be considered conjointly, because the latter is generally the only symptom, subjective or objective, upon which the malingerer grounds his complaint as to his suffering from the former. And here the exercise of careful discrimination is specially necessary, inasmuch as dyspeptic disorders constitute the great bulk of minor ailments to be met with in general practice, and, moreover, in many cases beyond the range of suspicion, we have to rely almost exclusively on the sensations of the patient. In differentiating, therefore, between cases, we can only approach to a sound conclusion by what is called a process of exclusion. If we find the tongue clean, the pulse normal, the bowels regular, and the general appearance of the patient healthy, there is strong presumptive evidence that the dyspepsia and pain complained of are feigned, or, at all events, exaggerated, and the patient may either be informed that his ailment is of too trifling a nature to require treatment, or he may be treated with a black draught, which will do no harm if it does not do much good. There is another mixture found to be very serviceable in cases of questionable or exaggerated illness of a dyspeptic nature, which goes by the appropriate name of "choke-em-off" amongst prisoners, and, by way of variation, is dubbed in therapeutical phraseology, *mistura amara*, or *haustus spasmodicus*. It is compounded of sp. am. fœtid., assafœt., tinct. valerian, and infus. chirettæ; and, to judge by the facial expression of the patient after swallowing a dose, it maintains the high reputation which drugs in general possess as regards their nauseous properties. In persistent cases of simulated dyspepsia, an emetic is found to be very advantageous. Sometimes, as a proof of the genuineness of the dyspepsia complained of, the patient maintains that his bowels have not been moved for days or even weeks, and that the aperient medicine prescribed for him on repeated occasions has had no effect, although he has gone to the water-closet and strained to his utmost. In the absence of any signs of fæcal accumulation in the abdomen, it is advisable to put such cases under observation, when, as a rule, it will be found that the bowels are moved within twenty-four hours without the aid of medicine, thereby clearly establishing their feigned nature.

I need not say that when the pain complained of is severe, a physical examination of the patient is necessary in addition to inquiries concerning the character of the pain, its seat, its relation to time, whether constant, periodical, or occasional, whether after or before meals, etc. When colic is feigned, the malingerer generally betrays himself by complaining loudly on palpation or pressure. The treatment which I pursue in such cases is to administer an emetic, or order turpentine stupes to be kept applied until the patient admits that the pain is removed.

In connexion with this part of the subject, I may briefly allude to that species of feigning which simulates loss of appetite, or partial or total abstinence from food for a time. A prisoner will readily enough maintain that he does not take his food, when all the while he is taking the whole of it; but there are two checks which prevent his gaining anything by this mode of scheming,—for, in the first place, the rules of the prison not only forbid him to give away his food to a fellow-prisoner, but enjoin him to return any food which he cannot take to his warder; and, in the second place, every warder has instructions to bring to the notice of the medical officer any prisoner who is in the habit of returning portions of his food. The cases, therefore, which present any degree of difficulty in the way of management are those in which food is habitually and intentionally returned, the patient giving loss of appetite as a reason. Such cases should be admitted into hospital for observation, and the ordinary full hospital diet allowed at first; it will then be found that while part of the bread and potatoes are returned, the meat and soup are taken. The patient is also very careful to state the quantity returned, and will rather overstate than understate it. If there are no symptoms to indicate why his appetite should be deranged, he is next put on low diet and ordered a *placebo* mixture—a plan of treatment which is usually attended with the happiest results, for in a day or two he will gently insinuate that he thinks he could take a little more food, as the medicine has decidedly done him good. Obviously it would be bad policy to grant his request, because, if granted, his *ailment* would in all likelihood become chronic; he is, therefore, gravely informed that, in order to prevent a *relapse*, it is necessary he should be kept on this diet for a few days longer, and that he should continue the medicine. So soon as his request for increased diet becomes importunate, he is told that since he has regained his appetite, he is now quite well, and is accordingly discharged from hospital *cured*. This feigned loss of appetite is likewise often resorted to by patients who have been admitted into hospital for some genuine ailment, and who are very anxious to prolong their stay, as the majority of prison patients undoubtedly are. To those who are constantly saying that although they take their food they have to *force* it down, little attention need be paid.

In complete abstinence from food, or refusal to take it, recourse should be had to the stomach-pump. I have seen several very obstinate cases of the kind in prison, generally associated with feigned insanity; but a little rough feeding with the stomach-pump has always resulted, after a longer or shorter interval, in the prisoner's taking his food without compulsion. If the introduction of the œsophageal tube be resisted, as it commonly is, I use the screw gag, inserting it between the upper and lower molars of one side; and should the food be voluntarily ejected afterwards, both gag and tube are retained *in situ* for some time.

Cases of this description, occurring in general practice, and amongst hysterical females, are usually feigned, the patient obtaining food surreptitiously. Even in such cases, although the treatment might appear harsh, my own opinion is, that the stomach-pump should be used when more lenient measures fail; at all events it may safely be said, that had some such active steps been taken in the case of the Welsh fasting girl, or even had she been left to herself, there is no doubt that her life would have been saved, and a public disgrace to the profession avoided.

The next point of any importance connected with feigned diseases of the digestive system which comes to be considered, is distention of the abdomen. This can be readily simulated by arching forward the lower dorsal and lumbar portion of the spinal column, by keeping the lungs well inflated, and thus depressing the diaphragm, while, at the same time, the shoulders are thrown well backwards. Under these conditions the girth of the waist is increased, and the surface of the abdomen becomes tense and protuberant. Although I have met with a few such cases among convicts, this mode of scheming is seldom resorted to, because it is easily detected on a first examination. The patient should be divested of his shirt, and laid on his back on a hard mattress, or, better still, on the floor. The overarched state of the spine will then become apparent, and if steady pressure be made with the hand on the abdomen, while the patient is directed to count as long as he can without taking an inspiration, the distention will gradually subside. Should he not comply with the instructions, and, instead of making a prolonged expiration, keep taking "short breaths," the nature of the case becomes clear, and no further trouble need be wasted on it. I have met with only one case of abdominal distention produced by other means, and from the markedly tympanitic sound emitted on percussion, I had every reason to believe that the distention, which was very considerable, had been brought about by swallowing air; at any rate, it soon disappeared under a course of tartar emetic and sulphate of magnesia.

Whether prolapsus ani can be artifically produced or not, I have little doubt, judging from cases which have come under my own observation, that when it does exist, a malingerer can, at any time, exaggerate it to such an extent as to unfit him for work. Not long ago, a prisoner, who had been admitted into the hospital for debility and loss of flesh, began to complain shortly after his admission that his "seat" came down, and that he was losing a great deal of blood every time he went to stool. On examination, a large portion of the rectum was found to be protuding, and there was some blood in the night-stool; there were also traces of blood about the points of his fingers, which the patient accounted for by saying, that he had been trying to force back the "gut." As I had once seen a somewhat similar case before, in which the prisoner had been detected using a small pointed piece of wood to wound the rectum, and so produce bleeding, I strongly suspected that in this case the fingernails had been employed for the same purpose, and my suspicions were strengthened, because the same condition of things was repeated at each visit. I used a strong solution of nitrate of silver, made the patient keep the recumbent position, and gave him a rectum plug to wear; but, day after day, he complained that he was no better. It so happened, however, that there were some patients in the hospital at the same time who were about to be removed to an invalid prison, and I have no doubt he was aware of this, and hoped that by persevering long enough he might be sent along with them. Whether this was the case or not, he expressed himself as being much better the day after their removal (there was no blood in the stool and no prolapsus), and he wished to be allowed to get up and go to work again. He was discharged from hospital shortly afterwards, and although he has been employed at the ordinary hard labour of the prison ever since, he has not presented himself a second time as a complainant. A few other cases of the same kind have come under my notice, but the daily application of a caustic solution with a probang pushed well up the rectum, along with the recumbent position and confinement in a separate infirmary cell, has always succeeded in ameliorating the prolapsus to such an extent that the patients have soon become fit to resume work and have given no further trouble.

When bleeding from the rectum is complained of, the patient's linen and drawers should be examined, because in genuine cases blood-stains can almost always be detected, and the absence of them, therefore, makes the case look very suspicious. But sometimes a malingerer will show a quantity of blood which he asserts has been passed in this way, when it is found that it has been derived from the nostrils. The following is an instance of this form of scheming:—One morning I was roused out of bed to visit a prisoner, whose cell-floor was said to be covered with blood. I found him groaning in bed, and there was certainly a considerable quantity of blood on the cell-floor, in his pot, and on the sheets of the bed. He said that he had passed the blood from his bowels, and that he was in great pain; but as he was an old malingerer, I was very doubtful, about the truth of his statements. Accordingly, I pushed my finger up his rectum, and, on withdrawing it, could discover no signs of bleeding from that quarter; but on examining his nostrils I found abundant evidence as to how the bleeding had been produced.

Internal hæmorrhoids are often pleaded as a disqualification for being put to the more severe kinds of prison labour. As they sometimes do not exist at all, and, when they do exist, are often made the most of, an examination with the anal speculum is essential to a correct diagnosis in each particular case.

IV. Feigned and factitious diseases of the urinary system chiefly affect the following pathological conditions, viz., incontinence, retention, diabetes insipidus, and hæmaturia. When a prisoner complains that his urine is constantly dribbling away from him, it is a matter of importance that he should be examined at once, because it very often happens that he has not reckoned upon such examination, and his linen, therefore, will be found dry. But sometimes, having prepared for this contingency, he presents himself with his linen properly soaked, and it then becomes a question whether or not this is owing to incontinence. If he be malingering, there will be an absence of the disagreeable urinous odour which is always more or less perceptible in the real affection, and the penis and neighbouring parts will not present the characteristic moist and chafed appearance. To clear up any doubts, the mattress on which he has slept should be examined. Persistent cases should be admitted into hospital for observation, and a catheter passed at an hour when a visit is least expected. If a considerable quantity of urine be drawn off, and if it issue in a tolerably strong jet, there need be little doubt as to the feigned nature of the case, because when incontinence is due to a paralyzed condition of the bladder and consequent over-distention, the urine, unless in recent cases arising from accident, is ammoniacal, and, moreover, it is always associated with some serious form of disease, as paraplegia, apoplexy, fever, etc. As another diagnostic test, a good dose of opium might be administered at bed-time, and the sheets examined towards morning before the patient awakes. In all feigned cases, and when the bed is "wetted" every night, I know of no more efficacious treatment than to have the patient aroused every hour or so, and made to get up and urinate. With the exception of some rather aged prisoners, and of a few cases of serious disease, I cannot call to mind any *genuine* case of incontinence occurring amongst prisoners, and I therefore feel warranted in saying that, amongst adults, the real disease is extremely rare.

Retention of urine (using the term as quite distinct from suppression) is invariably connected with an over-distended bladder, a condition which can readily be diagnosed by palpation and percussion, while, by passing a full-sized catheter, the existence or non-existence of stricture and the amount of urine can be established. The detection of feigned cases, therefore, is not difficult, and need not require any further remark beyond this, that they are more common amongst female than amongst male prisoners.

Of more frequent occurrence than either of the above modes of scheming is that of feigned diabetes insipidus. As this may be simulated by adding water to the urine, or by drinking large quantities of water and thereby increasing the flow, it is necessary that all such cases be put under strict observation. The quantity of liquid allowed should be clearly stated, and precautions taken that the patient obtain no more than this allowance. It is also advisable that all vessels be removed from the cell, and that the patient, when he wishes to pass water, should be able to intimate his desire to an attendant, in whose presence it should be voided and then removed. Both the quantity and specific gravity can thus be accurately ascertained, and, within twenty-four or forty-eight hours at the utmost, the nature of the case clearly established.

With regard to hæmaturia and other abnormal appearances of the urine, it is likewise requisite that the patient be made to urinate in one's presence, and, in the event of his refusing or asserting that he cannot do so, to pass a catheter. Malingerers will sometimes mix blood, milk, dirty water, etc., with their urine to alter its appearance; but by adopting the above measures, imposture becomes impossible. Indeed, on all occasions when an examination of the urine is intended, it is necessary, at least in prison practice, that it should be voided in the presence of some responsible person, and immediately removed, otherwise its appearance and analysis may become alike very puzzling. Cases have been recorded in which blood and other substances have been introduced into the bladder, but they are of such rare occurrence that the mere mention of them will suffice.

V. So far as my own experience goes, feigning in connexion with the generative system has been confined to females. The distention of the abdomen already described is sometimes simulated by female prisoners to imitate disease of the "womb;" and though the same means of diagnosis will generally succeed in detecting imposture, it is necessary to bear in mind that, in this class of patients, abdominal distention may actually exist independently of any enlargement of the uterus or other organic disease, as, for example, in cases of so-called spurious pregnancy and hysterical tympanitis. Cases of feigned prolapsus uteri, leucorrhœa, and menorrhagia have occasionally come under my notice, but a digital examination, along with the evidence of a female attendant as to whether or not the linen was stained, rendered detection easy. I may add that women who have had children, and in whom the uterus and its appendages are relaxed, can readily simulate partial prolapsus by "bearing down" when an examination is made, but the requisite straining cannot be attempted without becoming apparent.

VI. Feigned and factitious diseases of the locomotive system include such deformities and affections as curvature of the spine, wry neck, stiff joints and contracted limbs, elevated shoulder, lameness, anasarca, rheumatism, the effects of injuries, and mutilation. Although my opportunities have not been extensive enough to enable me to discuss all these different conditions from personal observation, I may briefly allude to some general principles applicable to most of them, which have been laid down by the best authorities as aids in diagnosis. For example, in a case of suspicious deformity, whether arising from spinal curvature, gibbosity or elevated shoulder, or from a stiff joint and contracted limb, it is recommended to inquire, first, as to how and when the deformity originated, and afterwards to have the patient stripped, either wholly or to the extent requisite for a full and complete physical examination. If the case be one of lateral curvature of the spine (the kind generally feigned), the extent of the curvature and general condition of the spine should be noted, as should also the marked elevation of the haunch on the concave side, the singleness and situation of the curvature (dorso-lumbar), and the absence of gibbosity on the convex side—all these being points which are more or less diagnostic of this variety of scheming. As a test, the patient should be examined when lying on his belly, the loins fixed with a tight bandage, and the arms extended above the head, or he might be made to suspend himself by the hands from a beam or rope. Gibbosity could be detected in the same way. Stiff joints, on the other hand (several feigned cases of which I have myself seen), should be carefully compared with the corresponding healthy joints of the opposite limbs, it being found that, besides a connected history as to how the stiffness arose, there are always abnormalities more or less discernible in the size and conformation of a joint which has become stiff as a result of accident or disease. A feigned stiff knee-joint can be readily detected by fastening the patient in a sitting posture on a table, with the joint projecting over the edge. In this position the power of the extensor muscles of the thigh will soon become exhausted in keeping the leg straight, and consequently it drops. By suspending a weight, such as a bucket, from the ankle, and afterwards pouring a little water into it, the period of resistance will be considerably shortened; but in adopting this plan of treatment it is necessary that the patient be fastened to the table, else he will slip off, bucket and all, as once happened to myself, so soon as he finds the bucket becoming uncomfortably full. This plan of suspending weights to limbs, whether the arm or leg, has often succeeded in the hands of army surgeons in detecting imposture; but I think the same ends could be gained, and perhaps as satisfactorily in some cases, by fixing suitable splints capable of being extended by means of a screw. Opium or chloroform may also be employed to great advantage.

Amongst convicts, œdema or the swelling of a limb, rheumatism, the results of injuries and self-mutilation, are more liable to be feigned, exaggerated, or produced than the varieties of scheming noticed above. I have seen a few cases of feigned, stiff, and contracted fingers, but there was not much management required in curing them. Swelling of a limb is produced by ligature; indeed, so commonly is this practice resorted to in prison, that all swollen limbs should be examined for the traces of ligature. Injuries likewise are aggravated in the same way, and the cure protracted, as in a case of fracture of the lower third of the radius not long ago under treatment in this prison. It was observed one day, after firm union had taken place, and when only a bandage was necessary for support, that the hand was very much swollen. This at first sight was attributed to over-tightness of the bandage; but, on discovering that the swelling also extended above where the bandage was applied, a further examination was made, and a ligature was found tightly tied round the arm a little above the elbow-joint. Another form of factitious swelling is the puffiness of the dorsal surfaces of the hands or feet, or of the lower part of the forearm on the radial side, which is often produced by thumping for a time on one or other of these parts with the closed fist. The parts themselves, when presented for examination, are swollen, red, and slightly bruised-looking, but without abrasion of the cuticle, and, when once seen, the character of such swellings is readily recognised afterwards. The malingerer generally attributes them to a blow or sprain of some kind which he says he has received on the works. The plan I adopt in dealing with such cases is to tell the prisoner frankly how the swelling has been produced, and to dismiss him with the caution that if the same trick is tried again he will be reported.

Rheumatism, and more especially that particular form of it called lumbago, is also made a frequent pretext for avoiding labour; but here, as in cases of dyspepsia, it is not always easy to discriminate between the feigned and the genuine disease, inasmuch as chronic rheumatism may present no objective symptoms. Persistent cases, therefore, should always be admitted for observation; and if it be found that the patient sleeps soundly on sheets, a dose of the galvanic battery and a little low diet will in all likelihood produce a speedy cure. When lumbago is complained of, it is best to humour the patient at the outset by examining the pulse, tongue, loins, etc., then to ask him whether he has observed any puffiness about his ankles lately, and end by requesting him to pull down his stockings to show them. As a rule, he will be taken off his guard by the interest displayed in his case, and will bend his back with an amount of alacrity which one really suffering from lumbago would envy, and, in fact, dare not attempt. But sometimes a fellow with his wits about him is not so easily caught, and then the wisest and most effectual course is to treat the case as genuine, and administer hot turpentine stupes.

When a convict receives a sprain or fracture of any kind, he is very apt to make the most of it by protracting the cure; and should he receive a contused wound, he will sometimes render nugatory all other surgical aid by "doctoring" it himself. After amputation, he will even interfere with the stump, so as to induce necrosis, and thereby sometimes necessitate re-amputation a little higher up. After injuries of the former description, he should be discharged to light labour on trial, so soon as a reasonable time has elapsed to effect a cure and all swelling has disappeared. Should there be no subsequent duskiness of the part nor return of swelling, he may safely be kept at his work, no matter how earnest his protestations may be that he is unfit to leave the hospital. In cases of wounds or amputation, the dressings should be so applied that they cannot be interfered with without discovery.

Self-mutilation is another feature of malingering, not at all rare in hard-labour prisons. Some time ago, a convict divided both tendines Achillis at Portland to disqualify himself for work; and the medical officer of Chatham Prison writes, in his annual report for 1869, that "bruising of the hands between the buffers of railway carriages has been a very common mode of producing bad accidents, and thus gaining admission to the infirmary. Of the fracture, one death is recorded, which occurred from a prisoner purposely putting his foot under the wheels of a railway engine in motion; his leg was dragged under the wheel, and amputation was performed; but he died some days afterwards from tetanus." A few cases belonging to this category, but not in any way serious, have occurred at this prison during the present year. All such cases are of course treated for the injury, and are justly punished when they are fit.

VII. Under the heading of the integumentary system, remain to be considered factitious abrasions, ulcers, and abscesses. At one period soldiers were much addicted to producing tolerably fair imitations of such skin diseases as tinea decalvans, urticaria, erysipelas, and impetigo, by the use of various irritants and blistering substances; but now that the study of these diseases has become so much more general, I imagine that this variety of scheming has become very rare. In prison, I have only seen one case of feigned skin disease, which was, however, limited to the forehead and both cheeks. The cuticle had evidently been rubbed off with a rough towel, and the bleeding, ichorous surface had been well soaped to keep up the irritation. Being satisfied as to the nature of the case, I had the parts carefully washed and dried, and afterwards brushed over with collodion, thereby preventing the patient from tampering without my knowledge. In three days the thin crusts had all cleared away, and the healthy skin appeared beneath. As I have already said, such abrasions as these are sometimes met with in cases of feigned epilepsy, and are produced in order to give the impression that the patient must have fallen during one of his "fits." But more frequently they are made on the shin, and attributed to an accident, the patient in this instance stating that he shows the abrasion thus early lest he should be suspected of tampering with it in the event of its *festering*—a result, by the way, which is not at all unlikely if he be not cautioned at the time; for, generally speaking, the convict who assumes this air of injured innocence is the very fellow who *does* tamper when he thinks he can do so with impunity. In the vast majority of cases of ulcer that occur in prison, I believe the ulceration is commenced in the first place by producing an abrasion, and afterwards keeping up the irritation by applying soap, lime, whiting, etc. This variety of malingering goes by the name of "faking," and is often resorted to in wounds of all descriptions to prevent them from healing. The factitious ulcer is almost invariably found on the leg, or, less frequently, on the forearm. Its edges are generally circular and well defined, without being callous; its surface healthy-looking when cleaned; while the surrounding skin is natural in appearance, except where ulceration has formerly existed. In short, its distinguishing characteristic is an entire absence of a *raison d'être*, so to speak; its existence being altogether inexplicable, except on the ground of artificial production. Sometimes with the aid of a magnifying glass minute particles of whiting, glass, etc., can be detected, but usually examination can only decide that both ulcer and dressings are dirtier than they ought to be. The most effectual plan of treatment is to dress the ulcer in such a way that it cannot be tampered with without discovery, and this mode of dressing should, as far as possible, be adopted with regard to all wounds. Various methods have been proposed, such as sealing the bandages after they have been applied, or painting lines on them, or by enclosing the limb in a wooden box, as first carried out by the late Mr Hutchison. All these have proved more or less serviceable in the detection or prevention of interference, but the plan which I have found to be most efficacious, in a curative as well as preventive sense, is an adaptation of the antiseptic system of treatment, varying it according to circumstances. The first desideratum is to have the wound or ulcer thoroughly cleaned, washed with a carbolic acid lotion, and dried; then, if it be small and superficial, a coating of styptic colloid or collodion will suffice; if it be larger, say about the size of a florin, the part of the limb affected is strapped, and a coating of styptic colloid applied over the strapping; if it be larger still, a layer of carbolized cotton-wool is applied directly over the ulcer; this is brushed over with styptic colloid, and, over all, a bandage is applied which is also coated with the colloid. In some cases gutta-percha tissue may be advantageously employed in addition. In this way the dressings cannot be disturbed by the patient without detection, and they should not be removed until a reasonable time has elapsed for healing to have taken place. If there should be any tendency to the oozing of pus through the dressing, as will happen in large ulcers, it should be washed with a strong solution of carbolic acid, and a fresh layer of cotton-wool and another bandage be applied over the first dressing. Without going further into detail, I would strongly advocate Professor Lister's plan of dressing in all wounds of whatever description, not only for its intrinsic merits, but because it is a safeguard against tampering in suspicious cases. In simple abrasions, or small ulcers of the leg which are undoubtedly artificial, a very successful plan of treatment is to insist on the limbs being kept exposed day and night outside the bed-clothes, in which case no dressing need be applied.

Factitious abscesses are likewise of common occurrence amongst convicts. They are produced by inserting a small pointed piece of wood or pin, covered with dirt, which is allowed to remain long enough to excite inflammation. The malingerer does not present himself until suppuration has set in, and the surrounding parts are highly inflamed. I have seen several cases of this description, and have found that the puncture is always discernible although it may have closed up. The pus, when the abscess is opened, has a dark sloughy appearance, and sometimes contains some fragments of foreign substance, which clearly establishes the character of the case. As an instance of this kind of malingering, I quote the following from the annual report for 1869 of the medical officer of Portland Prison:—"A man under punishment complained of a sore in his foot. On inspection I found a small punctured wound on the side of the sole. On asking him how he came by it, he replied that a piece of wood ran into his foot while walking to the closet. Knowing that he must have worn a shoe at the time, and that, therefore, if his story were true, there must be a mark of the splint having passed through it, I examined it, and found no trace of this having been the case; and, though consequently disbelieving him, I gave him, as usual, the benefit of the doubt, and ordered him poultices, bed, etc. His foot became much worse, and highly inflamed; he began to be alarmed (which feeling I did my best to increase), and at last confessed that he had run a piece of stick into his foot. The wound was, therefore, laid open, and I extracted two pieces of wood, each about an inch in length. He appeared very penitent, and promised never to repeat the offence. He was placed on hospital diet, his health having at this time suffered very considerably, and, the wound having healed slowly, he was discharged and began his punishment again. Three days after it reopened, and was nearly as bad as ever; and though he strenuously denied having tampered with it, on a strict watch being kept over him the officer in charge discovered, very neatly hidden in his cell, two inch pieces of pointed stick and one of stone, with string attached to them, that they might be placed and replaced at will within the wound."

So great is the detestation of many prisoners for work that it is only by having recourse to sharp repressive measures that the more frequent occurrence of cases of this description can be prevented, and hence it becomes the duty of the prison surgeon to report, without the least hesitation, any clearly-established instance of malingering, so that the culprit may be duly punished. Factitious ulcers and abscesses are, I believe, more generally resorted to in public works' prisons than any other form of scheming, chiefly because they disqualify for work for the time being, and because the convict knows that unless the evidence against him is beyond doubt, he will be treated as an ordinary patient, and escape punishment altogether.

There is another aspect of feigning occasionally exemplified in prison life, but which merits only passing notice—I refer to feigned attempts at suicide. Hanging is the mode usually selected, and the feigned attempt is characterized by being made at some opportune moment when the proceeding is sure to be interrupted. Sometimes a prisoner threatens to commit suicide in order to be put under observation, but I have always found that he may be safely left to his own resources without the least risk of his putting his threat into execution.

In bringing this sketch of feigned diseases to a conclusion, I am afraid that its practical utility may be somewhat curtailed owing to the special stand-point from which alone I could treat the subject clinically, and as a matter of personal observation and experience. But though the class of patients may vary, the same differential data are as generally applicable in the detection of feigned diseases as are physical signs and symptoms in the diagnosis of real disease; and hence it is chiefly in the *management* of feigned cases that the circumstances of the patient take effect. It is true the prison surgeon possesses facilities for enforcing strict observation, and the carrying out of his instructions, that are not at the disposal of those engaged in general practice, but he is none the less bound to obey those dictates of humanity which secure to the suspected schemer the "benefit of the doubt," and to the undoubted schemer protection from any kind of medical treatment bordering on the cruel or barbarous.

ARTICLE VIII. — *On the Treatment of Diabetes by Lactic Acid (Cantani's method).* By GEORGE WILLIAM BALFOUR, M.D., F.R.C.P.E., Physician to the Royal Infirmary, Edinburgh.

(*Read to the Medico-Chirurgical Society of Edinburgh, 15th November* 1871.)

TOWARDS the end of last century (1796) John Rollo first propounded the theory that diabetes mellitus consisted essentially in some morbid change in the functions of digestion and assimilation, and conceived the idea of remedying this anormal condition by cutting off from the food the supply of starchy matter from which he believed the sugar to be chiefly formed, employing also emetics, narcotics, and tonics. Rollo thus laid the foundation of that system of treating diabetes which still prevails, which, mainly dietetic, consists also largely in the administration of tonics and narcotics. In France this theory and treatment were adopted by M. Bouchardat (1841), who further showed that, for the complete conversion of starch into sugar, from seven to eight times its weight of water is required; thus accounting for the terrible and irresistible thirst of diabetic patients wholly irrespective of their excessive urination, which may be regarded as produced by the excessive ingestion of fluids rather than as its result.

The more important variations in the dietetic treatment of diabetes in recent times have been—1st, The use of alkalies, chiefly the carbonated alkalies, which is based upon Mialhe's theory (1843), that the sugar formed from the starchy articles of food in a healthy body is destroyed by the natural alkalinity of the blood, a property he supposed to be defective in diabetic patients. This theory has been shown to be wrong in every point, yet the treatment founded upon it has had a considerable amount of success. 2d, We have Reynoso's theory (1853), that the sugar in the blood of a healthy subject is burned in the lungs, and that it only appeared in the urine because of defective respiration; he therefore recommended a stimulating plan of treatment to increase the respiratory function; and the employment of the peroxide of hydrogen in modern times, as well as that of the permanganate of potass, is based upon this view of the origin of diabetes, which, although accurate enough in the fact that sugar does frequently appear in the urine of those whose respiration is impeded, is yet in so far defective that the development of grape sugar into lactic acid, the first stage of its combustion, requires no oxygen. 3d, Claude Bernard's remarkable experiments (1848)—which seemed to prove the nervous origin of this disease, but which Schiff showed could not act without a liver, and acted mainly, apparently, by producing hyperæmia of that organ—gave a considerable impulse to the use of narcotics and nerve sedatives, especially such as opium, codeia, and bromide of potassium, which so act upon the vaso-motor nerves as to reduce hyperæmia, all of which give considerable relief, and have had a certain amount of success. 4th, We have a modern return to the more purely dietetic treatment of diabetes in the employment of skim-milk as the sole article of food, a method of treatment which has been lately extolled by Dr Donkin of Sunderland.

Now, without entering more at large into the pathology of diabetes, it is obvious that these various modes of treating it are all underlain by one common fact—viz., that in diabetics the natural glycogenic function is discharged in a morbid manner, and that this morbid discharge of function may be importantly modified in two modes; 1st, by depriving the organism of that pabulum from which the glucose is mainly derived, and, 2d, by employing such remedies as are capable of altering the nervous energy of the organs at fault: practically it has been hitherto found of importance to conjoin these two methods.

The chemical treatment of diabetes by the attempted burning the sugar by artificially induced hyperoxygenation of the blood, has not been found more successful than the simple dietetic plan without this addition, and for the chemical reason stated this could not be otherwise. While the basis of the other chemical treatment, that by alkalies, has been shown to be erroneous, the blood of diabetic patients being not less alkaline than that of others on the one hand, while on the other, a fluid even more alkaline than blood cannot decompose glucose, so that if the alkaline treatment have really proved more successful than the simple dietetic plan, that must have depended on its exercising some modifying power over the function at fault—a modifying power, however, of so doubtful a character that it has not been able to prevent this method of treatment from falling, in this country at least, into comparative desuetude.

It is a matter of daily observation, that morbid alterations of function are frequently only to be permanently remedied by a restoration of the body to its normal standard, the great difficulty of promoting a cure in such cases being the impossibility of giving perfect rest to one organ while endeavouring to build up the frame, the skill of the physician being shown by the manner in which he solves this complicated problem, giving as much rest as possible to the organ at fault, while at the same time improving the general nutrition, and thus restoring the healthy tone to the constitution. It is in this respect that all the treatments hitherto propounded for diabetes have failed; they may have given rest to the organ at fault, but they have too often depressed the general health, and, while giving temporary relief, have possibly in many cases hastened the end; and even when a tonic treatment has been mainly relied on it has failed for want of physiological adaptation. It is in this respect that Cantani's treatment is pre-eminently useful; it relieves without depressing, it gives as nearly as possible perfect rest to the organ at fault, and at the same time builds up the body by an artificial adaptation of physiological means, and restores the healthy tone to the constitution, thus enabling it to return to healthy action. It is by no means put forth as a perfect cure for all cases of diabetes; it is a means of relief to all, but only a cure for some; yet it seems to act curatively in a larger proportion of cases than any other mode of treatment hitherto devised, while the relief to all is more perfect.

Professor Alnaldo Cantani of Naples agrees so far with Reynoso in believing that in diabetes the question is not so much one of increased production of sugar as of defective combustion; this he conceives to be proved by the small number of respirations made by diabetic patients and by their average low temperature, ranging, according to him, from 95° to 96°·8 F. in uncomplicated cases; the temperature, of course, rising with any complication—such as tuberculosis—giving rise to pyrexia, but always remaining below the normal of such pyrexia. This defective combustion he believes to depend upon the production of a morbid form of glucose, which he has termed *paraglucose;* this is incapable of being transformed into lactic acid, and therefore cannot be burned; it is consequently passed unchanged in the urine. The result of this is, that the sugar and starch of the food being transformed into this incombustible paraglucose, the heat of the body is in so far maintained at the expense of the albuminates and fats, and from the combustion of the former we have that excess of urea which adds so greatly to the density in many cases of diabetes, while, as the albuminates and fats which the patient receives as food are insufficient for his requirements, those of his own tissues are also employed, and hence his rapid emaciation.

In the early stages of diabetes the quantity of sugar passed in the urine oscillates with the diet, and with an exclusively animal diet is much lessened in twenty-four hours, and may entirely disappear in a few days; in the later stages, when sugar persists in the urine even after the withdrawal of all amylaceous food, Cantani believes that not only the inosite of the muscles may be transformed into paraglucose, but also that the gelatinous tissues, which Baedeker succeeded in transforming into sugar apart from the system, may in this anormal pathological condition become transformed into paraglucose, and thus account for the persistence of sugar in the urine of those fed exclusively on an animal diet apart altogether from the question of the albuminates themselves being transformed into diabetic sugar. Thus, though all diabetics are to a certain extent autophagic, we may yet have this abnormality developed to excess, and may thus have three steps in this disease: first, that in which the sugar oscillates with the quantity of amylaceous food supplied; second, that in which the inosite and gelatinous matter of the animal food are transformed into diabetic sugar; and, third, when not only these but also the inosite and gelatinous matters of the body of the patient himself are so transformed—a most severe and hopeless form of autophagia. Cantani, with most modern pathologists, recognises the liver as the organ mainly at fault in these cases; but whatever the organ may be, he proposes to give it as complete a rest as possible, by depriving it of its pabulum in subjecting the patient to a rigorous meat diet, thus reducing to a minimum the introduction into the system of the sugar-producing substances. But as that is only a temporary expedient, having reference to only one element of this disease, and incapable of arresting the waste and ultimate complete degradation of the body, he further proposes to prevent this waste by supplying a combustible agent in a quantity sufficient for the wants of the body, so that the fats and albuminates may continue to be stored, and the body thus gradually restored to its normal standard; and he hopes that this restoration of the healthy standard of the constitution, coupled with the prolonged functional rest to the organ affected, may suffice to prevent any relapse into its morbid condition even after a return to the ordinary dietetic conditions of modern civilized life. The result of Cantani's experiments have to a large extent proved the correctness of his views. The combustible agent which Cantani has selected is lactic acid, and it has been wisely chosen, inasmuch as it is in all probability that agent employed in the normal conditions of nutrition, representing as it does the intermediate stage between glucose and carbonic acid,[1] so that not only is a complete rest given to the organ at fault, but that very agent is supplied to the system which would have been normally present had the organ at fault been doing its duty after a normal fashion, so that while as complete a relief as possible is afforded to the organ at fault, there is in no respect any anormal strain put upon the system. The organ at fault is for the time being merely thrown out of gear, but all the other functions proceed in a natural manner, so that, when the normal tone of the organ has been re-acquired, it may again be replaced in the natural cycle without the harmony of the natural sequence of the functions being in any way interrupted either by the cessation or the restoration of its function. The quantity of lactic acid which Cantani administers is from 77 to 154 grains daily, diluted in from 8 to 10 fluid ounces of water, and taken during the day. His exclusively meat diet means rigorously one of plain meat, roast or boiled, without any sauces of milk or eggs, and certainly without any bread, flour, or any vegetable matter whatever, the only seasoning permitted being salt, oil, and a little vinegar. For drink he allows water, either plain or with a little of the purest alcohol; coffee, tea, and wine being prohibited. His results have been somewhat surprising. In recent cases the cure is stated to be almost certain and speedy; and even where an exclusively meat diet is not persisted in, life is apparently prolonged, and many of the unfavourable results of diabetes are prevented, though the mellituria is not arrested. Dr Sammut of Naples, from whose report I quote,[1] states that he has seen an army lieutenant enter the hospital emaciated, weak, and impotent, with polyuria, thirst, and extraordinary hunger. In twelve days the last trace of sugar had disappeared from the urine, and in six weeks the patient had gained nine pounds. He left the hospital in excellent condition—florid, strong, without thirst or hunger; he continued the treatment for two months more at home, and then resumed mixed diet, and after the lapse of eight months he was in excellent health, and weighed twenty-one pounds more than when he entered hospital, being also without a trace of sugar in the urine, though eating indiscriminately of all that came before him. A tailor from Naples was admitted in a desperate condition. He left florid and robust. Since then, for more than seven months, he has been eating promiscuously, and is more fat, rubicund, vigorous, and energetic than before his attack. Dr Sammut also states that he saw in Cantani's clinic several other diabetics—he mentions five—all much improved, and several believing themselves to be perfectly cured.

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[1] "What we have to do is to convert diabetic sugar—*i.e.*, glucose—into lactic acid."—Headland on the Actions of Medicine, 1867, p. 218.

These results are certainly very remarkable, and being a continuous series following the employment of a treatment based on rational considerations, are sufficient to claim the attention of every medical man interested in the progress of therapeutics. And I may remark that the latest treatment of diabetes propounded in this country—that by skim-milk—bears out Cantani's views in so far that it is a strictly animal diet, free from amylaceous matter, and containing three to six per cent. of lactin, which, under the influence of the caseous matter, becomes transformed into lactic acid. This treatment is therefore an approach, but a very meagre one, to Cantani's apparently more perfect system; and I may add that the results of the two systems in my own practice have fully convinced me of the greater applicability and more perfect success, so far as time allows me to judge, of Cantani's method.

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[1] *Vide* British Medical Journal, February 25, 1871, p. 208.

The first case in which I employed it was not a favourable one. The patient had been formerly much benefited by the conjunction of opium in large doses with the dietetic treatment. He returned two years afterwards with commencing phthisis, and though benefited somewhat by the lactic acid treatment, yet he died, as was naturally to be expected. His urine fell in five days from an average of about 250 ounces to 70 ounces in the day, the specific gravity remaining about the same—1·030; this high specific gravity being apparently due to the amount of urea and uric acid present, a condition of matters usual in this treatment. The deposit of red oxide of copper following the application of Trommer's, which had been copious, ceased entirely, and was replaced by a brownish discoloration due to the excess of uric acid present. No change took place on boiling with liquor potassæ (Moore's test). The poor man therefore lost the main symptom of his disease, but he died exhausted after about three months' treatment.

CASE 2.—David Hume, an engineer, aged 53, was admitted into Ward V. on July 14, 1871, complaining of great thirst, debility, and polyuria. Three years ago he suffered from a stroke of paralysis which affected the right arm and leg. He was able to resume work three months subsequently, but still complains of weakness in the right leg and dulness of hearing in the right ear. His integuments are rather dry, his joints normal, but his limbs are much emaciated, and he sleeps badly at night. Sensation and intelligence normal, but motion much impaired from his great exhaustion, having had to rest frequently in coming upstairs to the ward. He measures 5 ft. 7 in., and weighs only 8 st. 8 lbs. His tongue is dry in the centre, moist and clammy at the tip and edges, red, and glazed. His mouth and fauces dry. He has a constant bad taste in his mouth. His teeth are decayed. His digestion good, but his bowels usually constipated. His arteries are atheromatous, but the circulatory and respiratory systems otherwise normal. He calculates his total drink at 100 ounces daily, but he passes between 300 and 400 ounces of a pale-coloured urine daily, spec. grav. 1·030, and showing a large amount of sugar by the ordinary tests. He states that he has been under medical treatment for upwards of a year, but has nevertheless been gradually getting worse, and he dates the commencement of this illness between three and four years ago. Up to the 15th of August he received only ordinary diet and no special treatment, but this day he was placed upon a strict meat diet, consisting of 2 lbs. of boiled meat and 2 lbs. of steak in the twenty-four hours, which was the quantity he found to be sufficient. He was also ordered one teaspoonful of lactic acid in a tumblerful of water, to be taken in quantities sufficient to assuage his thirst. On the 29th of August his urine still contained sugar, was reduced, however, to 86 oz. in the twenty-four hours, his total drink being now stated to be 78 oz. This day he was ordered a bottle of diabetic koumiss in the day. Of this he, however, only drank about half a bottle daily. On September 1—his total drink being 48 oz.—he passed 48 oz. of urine rather deeper in colour, of spec. grav. 1·025, and containing no sugar. On October 1, the patient, having continued to improve uninterruptedly, was permitted to add to his diet four so-called bran biscuits, which contain, however, a large amount of starch,[1] and a cabbage. He takes his acid regularly. His total drink is now 36 oz., his total urine passed 40 oz., spec. grav. 1·025, and no trace of sugar. On October 20, two additional bran biscuits were granted to him; and on October 25 he was permitted to breakfast on porridge and skim-milk,[2] the bran biscuits being stopped, and his meat reduced to 2 lbs. daily, which is found sufficient. His weight is now 10 st. 7 lbs., and his urine keeps free from sugar. He was now put under surgical treatment for a stricture of the urethra, the lactic acid being continued, and bran biscuits gradually added to his porridge and skim-milk and meat diet, till he took six biscuits in the day. His drink and urine both averaged about 40 oz. in the twenty-four hours, the urine keeping free from sugar. On November 14, his weight was 11 st. in his drawers alone, and, feeling quite well, he was discharged. He was shown at the Medico-Chirurgical Society on the evening of November 15, and has orders to report himself occasionally, so that his further progress may be ascertained.

CASE 3.—Mary A. Early, a millworker, aged 15, admitted into Ward XIII., July 18, 1871, complaining of weakness, general malaise, polyuria, and diarrhœa, states that her present illness dates only from four weeks ago, when she was seized with headache, which lasted all day, nausea, great thirst, and diarrhœa. Her appetite being unimpaired, her previous health was good, and her family history unimportant. On admission her skin was hot and dry, limbs much emaciated, height 4 ft. 8¾ in., weight 4 st. 11 lbs. Complains of headache and great thirst. Her tongue is covered with a slight brown fur, moderately moist. Her bowels loose, several stools being passed daily. Her urine is pale, spec. grav. 1·030, and contains a large amount of sugar; its quantity is much increased, but cannot be measured on account of the diarrhœa present. Other symptoms normal. The diarrhœa was treated with chalk and opium mixture, and ceased in a few days. Her drink was now found to vary from 100 to 170 oz. daily, and the quantity of urine passed from 120 to 180 oz. On July 27, she weighed 4 st. 7 lbs., and was placed upon an *ad libitum* allowance of meat, of which she managed to consume about 2 lbs. daily, no extras. She had a bottle of soda-water daily, and two teaspoonfuls of lactic acid in a tumblerful of water as often as desired. The very next day her total drink sank to 32 oz., and her total urine passed to 22 oz. daily; and on July 29 all trace of sugar ceased to be discoverable, spec. grav. of urine remaining at 1·030, but containing a large quantity of uric acid and crystals of oxalate of lime; total quantity passed 20 oz., total drink 40 oz., in the twenty-four hours. After this she continued to drink with almost unvarying regularity 40 oz. in the day, passing from 28 to 40 oz. of urine, averaging 33·5 oz. daily for the three months, August, September, and October. On August 7, she weighed 4 st. 6 lb., having lost 1 lb. since being put upon her restricted diet, and on the 12th her weight remained the same. She says she feels quite well, but is unable to walk much or even stand long from a feeling of weakness across her loins. August 19.—Patient weighs now 4 st. 7 lbs., spec. grav. of urine 1·030, no sugar. On August 12, she was offered cabbage or green vegetables, which she declined, and was then allowed to get half a slice of toast in the day; but this was stopped on the 20th, on account of a slight trace of sugar which was found in the urine on that day. On August 25, the patient weighed 4 st. 8½ lbs., and was permitted to have some diabetic koumiss for drink. She did not like it, however, and only managed to drink three bottles of it between this date and October 3, when it was stopped. On September 17, patient weighed 5 st., and sugar having remained absent from the urine from August 12, she was allowed to have half a slice of brown bread daily. On September 30, patient weighed 5 st. 5 lb., a marked quantity of sugar was found in her urine, but as it was distinctly traced to her having eaten a slice of white bread and jelly which she had got from another of the patients, she was permitted to continue the brown bread. October 9.—Weighed 5 st. 7 lb. Brown bread stopped on account of slight discoloration of the urine when boiled with liquor potassæ. October 14.—Patient weighs 5 st. 9 lbs., and on 14th November 5 st. 10 lb., her height being 4 ft. 8¾ in. October 17.—The urine keeping free of sugar, the patient was allowed to have four bran biscuits in the day, which contain a notable quantity of starch; and on the 27th these were stopped, and porridge and skim-milk ordered for breakfast.[1] About the end of a week, however, a trace of sugar reappearing in the urine, the porridge was stopped, and for another week she was relegated to her meat diet, of which she takes about two pounds daily. After doing penance for one week she was again permitted to have her four bran biscuits, which she has continued to this date. November 16.—Her urine keeping free from sugar, 36 oz. in quantity, and spec. grav. 1·030.[2] Obviously this girl is far from being in the same satisfactory condition as Hume, but, considering her youth and the well-known obstinacy of diabetes in youthful patients, I think there is every reason to be thankful for the improvement she has made, and also strong grounds for hope that a more prolonged treatment will ultimately result in her restoration to health.

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[1] Weighing on an average 1½ oz. each.

[2] 1½ pint of porridge made from 4½ oz. oatmeal, and 1 pint of milk.

CASE 4.—U. M., æt. 25, an out-patient at the Infirmary, states that he has laboured under diabetes, so far as he knows, for three or four years, and has been frequently under treatment, without much benefit. There was a large quantity of sugar in his urine: he was ordered strict meat diet, with lactic acid and water for drink; to take not less than three, or more than four, teaspoonfuls of the acid in the day. Within a week he had gained two pounds in weight, and the sugar had sunk to a mere trace. The following week his weight remained the same; but he was fresh and hearty, the sugar a mere trace; his thirst had disappeared at once. He has been little more than two weeks under treatment; so all that can be said of him is that his case is hopeful. His stationary weight was probably due to his taking a considerable amount of exercise, at the same time restricting himself to only two pounds of meat in the day. He was ordered to take any quantity of meat he could consume; but as his time for calling has not yet come round, the result is not known.

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[1] Of this she only took about half a pint in all daily.

[2] Cases 2 and 3 have been condensed from the reports of A. J. M. Bentley, Esq., M.B., the resident physician.

Case 5.—A. L., admitted into Ward V. on 19th October 1871; says he has only laboured under diabetes for nine months, but is nevertheless greatly emaciated. The lactic acid treatment in this case certainly benefited the patient—the sugar entirely disappearing in a few days. He could not, however, be prevented from breaking through the rules and indulging in bread and other forbidden luxuries, and he was therefore dismissed on 17th November.

Case 6.—M. W., a girl aged 17, an out-patient of the Royal Infirmary, came under treatment, first, on the 3d November 1871; states that she has been ill about five months, and that she has been under treatment for three or four months, but has been getting gradually worse. She measures 4 ft. 8¾ in., and weighs 5 st. 2 lbs. Her urine is of a pale straw colour, and quantity large but unknown, spec. grav. 1·045, giving, with Trommer's test, a copious deposit of the red oxide of copper, and becoming of a dark mahogany colour when boiled with liquor potassæ. She was ordered a strictly meat diet, with a cupful of skim-milk for breakfast, and no other drink but water: three or four teaspoonfuls of lactic acid to be taken during the day. Nov. 11.—Urine same colour as formerly, spec. grav. 1·045; deep yellow discoloration with Trommer's test; no deposit; yellowish brown with the liquor potassæ. Has lost one pound in weight, but has had diarrhœa, more or less constantly, during the week, which may account for it. Thirst greatly lessened, and feels better. Nov. 18.—Weighs now 5 st. 5 lbs., having gained 3 lbs.; has a good appetite, and eats sometimes as much as 3 lbs. of meat during the day, and always 2½ lbs., besides a cup of skim-milk for breakfast; has now no thirst, and feels and looks fresh and well. Her urine is of a pale yellowish colour, acid, spec. grav. 1·030, giving a yellowish colour, and no deposit, with Trommer's test, and only a pale straw coloration with liquor potassæ. This girl, considering her youth, is obviously progressing favourably, and I hope to be able to give a good account of her at a future period.

CASE 7.—R. A., æt. 35, has suffered from polyuria for at least nine months, and has gone down from 10 st. to 8 st. 11 lb., his height being 5 ft. 10 in. He has such intense thirst that his tongue cleaves to the roof of his mouth, and the more he drinks the thirstier he gets; voracious appetite, and digests well; bowels costive, skin dry, and feels always chilly. Has no sexual desire, and has great languor both of body and mind. For the last three months has been subject to repeated attacks of an epileptiform character; his eyes seeming to go out of focus, and consciousness to be partially lost for a second or two; these attacks occur on the street occasionally, but most frequently on getting out of bed in the morning, or just after taking a cold bath. October 14.—Urine pale-coloured, quantity large but unknown; spec. grav. 1·040; contains a large amount of sugar. Ordered a strict meat diet, with beef-tea or plain soup if desired; three to four teaspoonfuls of lactic acid in water during the day, a little whisky and water at night, with claret during the day if desired, and also a bottle of diabetic koumiss, or as much of it as can be taken. The stimulants were permitted as the patient had a good deal of moving about before him, and his condition obviously required them. Within a week he felt much better, his thirst quite gone—in fact, he complained of having, as he thought, too much to drink; and he had gained two pounds in weight. On the 27th of October he weighed 9 st. 3 lb., was free from thirst, his drink amounting to 56 oz.; his urine was 66 oz., spec. grav. 1·028; and, on being boiled with liquor potassæ, its colour closely resembled No. 4 of Vogel's table of urinary colours. He was now permitted to add fowls, fish, and eggs to his diet, which had been hitherto strictly limited to beef and mutton, boiled or roast. On the 10th of November, his weight was 9 st. 5¼ lb.; and the average amount of urine passed during the fortnight averaged 56 oz., of an average spec. grav. of 1·033. On 14th November, however, he passed 30 oz. of urine at once in the morning, double his ordinary quantity; and on the 15th it was found to be of a pale amber colour, acid, spec. grav. 1·032, and gave a slight trace of sugar with Trommer's test, and a slightly darker tint than on the last occasion with the liquor potassæ. Obviously, some article in his diet was disagreeing; he was inclined to blame the koumiss, or perhaps the eggs, of which he had taken eight in one day; while I suspected he had got flour of some sort accidentally introduced into his food at some hotel. Be that as it may, however, he was at once again placed on a rigid meat diet, and already his urine has gone down one half. He looks and feels well, and is now almost free from his nervous symptoms, having only once had a slight threatening since coming under treatment.

These cases are very imperfect, and are only published on account of the importance and novelty of this mode of treating this hitherto so intractable disease, in the hope of enlisting others in the same inquiry, and thus more speedily determining its real value. This treatment is simple, physiological, and its results—viewing them as an unselected and continuous series—are certainly sufficiently remarkable to demand attention, being far before anything I have hitherto been able to attain by any other method whatever.

The lactic acid I have employed has been that obtained from the druggists, fluid, not syrupy, of a spec. grav. of 1·027, and with the ordinary musty smell of sour milk. Three to four drachms in the day seem to be quite sufficient for all practical purposes; yet much more may be taken without detriment,[1] cases 2 and 3 occasionally taking as much as eight or nine fluid drachms in the day. The remedy is, however, as yet rather too expensive to be employed in larger doses than are absolutely necessary, as it costs ten shillings a pound; a more extended application will, of course, speedily cheapen its production.

The great advantage of this treatment is the prospect which it holds out of a comparatively speedy restoration to ordinary mixed diet, with persisting absence of sugar from the urine—of rapidity of cure, in short; and this rapidity is in itself a great encouragement to such patients steadily to persevere, in spite of the irksomeness of a diet rigidly restricted to meat, which seems certainly to be required for two or three weeks at least, after which, fish, fowl, and green vegetables may be added, and other relaxations gradually and cautiously permitted, provided the case progresses favourably. I fancied that the koumiss was of considerable benefit in Hume's case, and if its composition be correctly stated, it ought to be a useful diet for diabetics, but a rigid analysis is still requisite. It is prepared by Chapman of Duke Street, London, and is said to consist of milk, fermented in a warm place by the addition of a small quantity of very sour milk; it effervesces slightly, and is pleasant to the taste, being apparently composed of the caseous matter in a state of extremely fine division, lactic acid, and a certain amount of alcohol, besides the fatty matter and salts ordinarily present in milk. The only apparent drawback to it is the statement that in cold weather it may act as a diuretic—an action which is certainly not required in diabetes.

Bonthron's diabetic biscuits are perfectly palatable, and I fancied they might prove a welcome addition to the very limited dietary permissible under Cantani's treatment. They are said to be prepared from finely-ground bran, washed as free from starch as possible, and mixed with albumen and butter. I procured some of these biscuits, and had them analyzed by Dr Stevenson Macadam, of Edinburgh; and the analysis, which I append, shows them to be wholly inadmissible in the early stages of this treatment, while, after a certain stage has been reached, they are not required, the ordinary bran biscuits of the shops, which are much more palatable, being perfectly sufficient, and forming an admirable introduction to more mixed dietary.

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[1] In particular, I have never seen any rheumatic pains produced; and if the acid be kept within proper physiological limits, it is impossible that they ever can be, otherwise we would all be rheumatic.

Analysis of Sample of Bonthron's Diabetic Biscuits, received from Dr G. W. Balfour.

Moisture, ...	18·84
Oil, ...	6·06
Albuminous compounds, .	35·56
Starch, with some gum, dextrin and sugar, . . .	34·58
Woody fibre, . . .	3·84
Ash, ...	1·12
	100·00
Nitrogen, . . .	5·69
Phosphoric acid in ash equal to ordinary bone phosphate, .	0·78

(Signed) STEVENSON MACADAM, Ph.D.

ANALYTICAL LABORATORY, SURGEONS' HALL,
Edinburgh, 16*th Nov.* 1871.

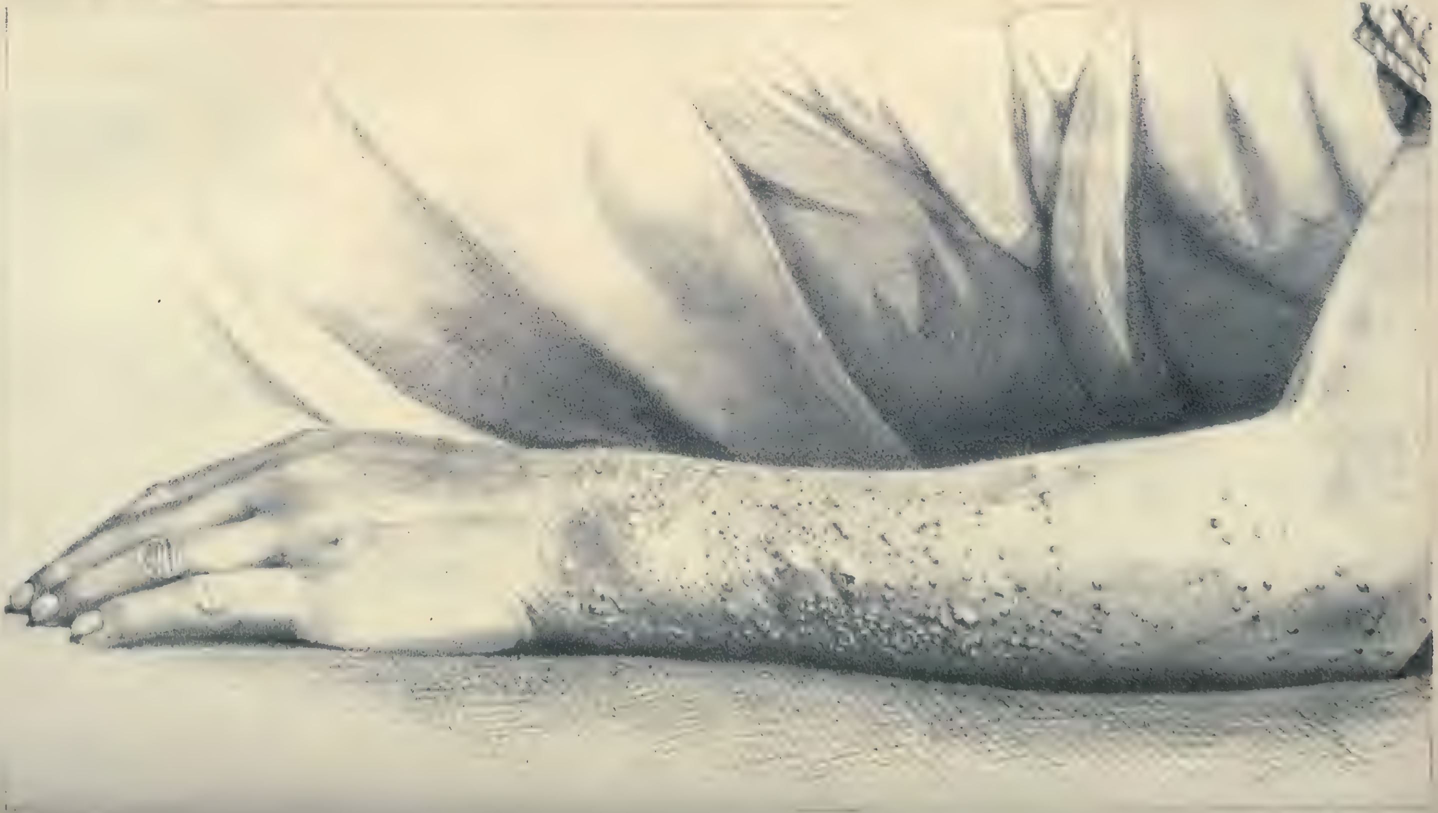
These biscuits, therefore, contain practically one-third of their weight of starch.

ARTICLE IX.—*On the Local Effects of Crude Paraffin.* By ALEX. OGSTON, M.D., Aberdeen.

THE Messrs Miller's Chemical Works at Aberdeen have afforded the opportunity for collecting the following information concerning the appearances produced on the skin of those engaged in the manufacture of paraffin, which seems of sufficient interest to warrant being recorded:—

The workmen engaged in this manufacture have the skin over portions of their bodies, more especially of the hands and arms, but also of the feet and legs, brought daily for many hours at a time into contact with the paraffin shale, and with the oily matters mixed up with it, the result being an eruption of nodules and pimples on the skin so exposed, speedily breaking out on those who are for the first time engaged in it, lasting for a few weeks or months, and then generally diminishing or disappearing. In a few exceptional individuals the eruption does not disappear, but, assuming a chronic

Edinburgh Medical Journal. Plate I.



Keith & Gibb Lith.r Aberdeen

ACUTE EFFECTS OF CRUDE PARAFFIN

character, produces so marked and prolonged an affection of the skin that the general health becomes impaired, and the cessation of this employment becomes a necessity. The appearances differ in the two classes of cases, acute and chronic, and, while the essential alterations in the skin remain the same, the presence of inflammatory action in the acute, and its absence in the chronic forms, leads to a marked distinction between the two, and admits of their being separately described.

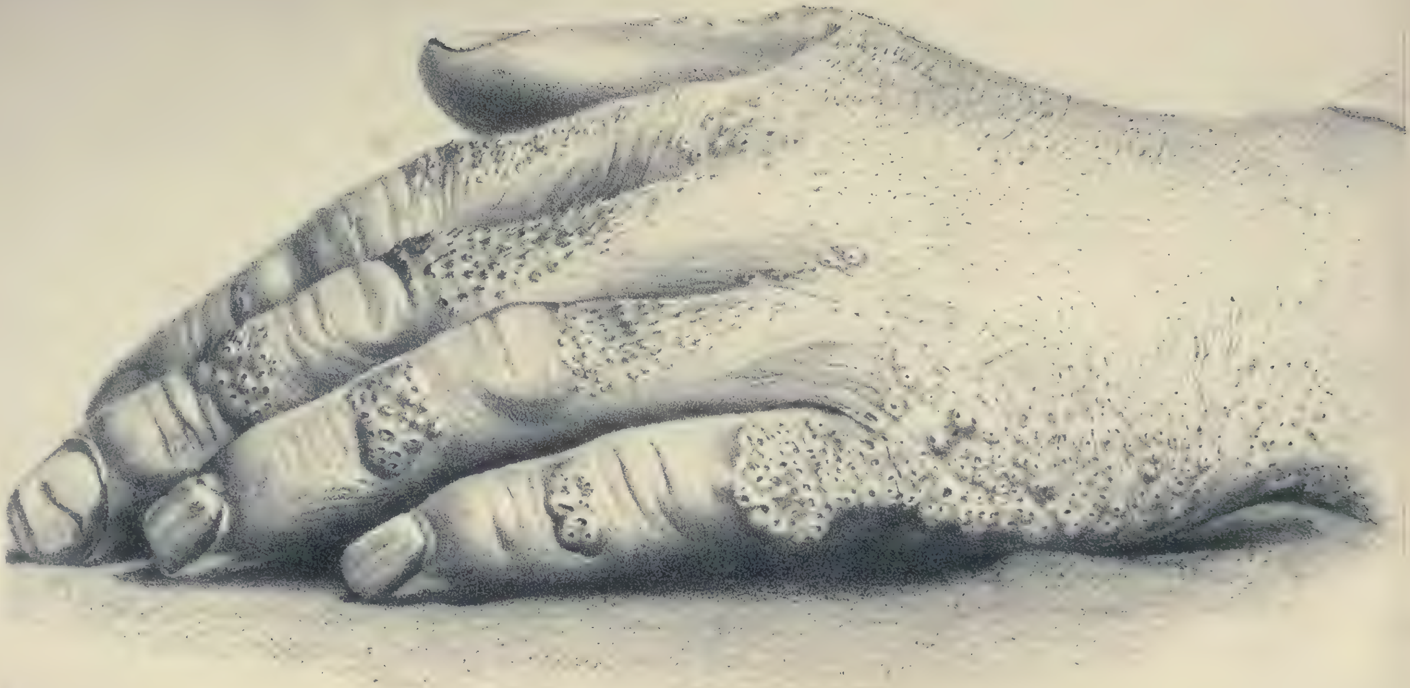
In the *acute* form of the eruption, which soon appears in those exposed to the influences of crude paraffin, the skin of the hands, wrists, arms, feet, and legs becomes covered with a rash of bright red nodules, closely approximate to each other, and usually largest and most numerous on the wrists, or wherever the dress tightly embraces the skin; the dorsal aspects of the parts being most severely affected, and the palms of the hands and soles of the feet enjoying a complete immunity. Similar nodules arise, though to a less extent, on the face, neck, and other parts of the body to which the oily matters find access.

On examining minutely the skin of those affected in this way, the following are the leading peculiarities of the eruption:—The bright red nodules, hard to the touch, tender on pressure, varying little in size, which is about equal to that of a grain of barley, are of a rounded form, and consist each of a single hair-follicle with the parts immediately surrounding it, which are inflamed, indurated, and reddened. The hair emerges from the very summit of the nodule, and the orifice of the hair-follicle is much enlarged and easily visible to the naked eye as an aperture of a magnitude similar to that of a pin-hole in a card. The dilatation extends to the deeper part of the follicle, which forms the kernel of the inflamed knot, the retention of its contents evidently contributing to the inflammatory induration around. The gaping mouth of the follicle exhibits masses of cast-off epithelial scales, dry and friable instead of greasy and tenacious; the nodule has little of the tendency to run on to suppuration observable in an ordinary *comedo*, and its contents cannot be squeezed out. On the contrary, the redness and induration, after remaining for some little time, gradually diminish, and finally disappear, leaving the hair-follicle enlarged, and its mouth gaping so as to exhibit the retained epithelial masses, these latter being rendered more distinct by continued retention and accumulation of dirt. In fact, the *acute* form of the eruption consists of successive crops of these nodules, which are thus at the same time seen in all stages of their growth, full development, and subsidence; while the skin between them, studded with the black gaping mouths of such follicles as have already passed through or are about to undergo the process, retains, contrary to what is observed in the chronic form of the malady, its natural pliancy and elasticity.

In all paraffin-workers patency and enlargement of the hair-follicles continue to some extent so long as they are engaged in this manufacture, and the black dots in the skin of their hands and face strike the eye of the observer at once; men with dark complexions and strong hair being especially deformed in this way, while fair complexions and light or reddish hair escape comparatively unaffected.

A few exceptional individuals, with swarthy complexions and hairy skins, suffer so much from an exaggerated patency of the follicles that they are compelled to quit their occupation and seek a more suitable calling. When the disease assumes this *chronic* form it exhibits the following characteristics:—The backs of the feet and toes, the dorsum of the hand, and the backs of the fingers between, but not over, the joints, exhibit a peculiar honeycombed appearance of the skin, which is elevated, thickened, and inelastic, so as to prevent or render difficult and painful the flexion of the fingers and hand. These elevated honeycombed patches are of natural colour, and not inflamed (except where an isolated papule exhibits the appearance described under the acute form), but consist of densely-grouped arrays of hair-follicles, with the indurated cutis between and around them, the follicles packed with dry brittle accumulations of epithelial scales, so extensive as to be easily visible through the dilated mouths of the follicles, these latter being large enough to admit the extremity of an ordinary probe. The hairs themselves have disappeared from these patches, having probably become atrophic from the pressure of the epidermic masses, while cracks and bleeding fissures traverse the indurated parts, and in rare instances a follicular abscess gives variety to the picture. The knuckles of the fingers and toes, the palms of the hands, and the soles of the feet, remain unaffected by the disease. In the subjects of the chronic malady the complexion is pale and the tongue foul, while the loss of flesh betrays the effects of the sleepless nights caused by the constant irritation and pain of the skin of the affected extremities.

The *modus operandi* of the crude paraffin in producing these results seems to be as follows:—The oily matters in the shale, called "blae oil," when separated, are both penetrating in their properties and irritating to the skin; and, coming continually in contact with the epidermis, soak into the hair-follicles, where they create an irritation soon leading to induration and increased exfoliation of epithelial scales. This exfoliation is not counterbalanced by increased expulsion of the scales, owing doubtless partly to the large quantities cast off, and partly to the usual fatty and lubricating substances mixed up with them being dissolved out and removed by the "blae oil," thus leaving the brittle epidermic masses plugging the follicles, and increasing the inflammatory irritation. (The palms of the hands, soles of the feet, and knuckles of the fingers and toes—places supplied with sweat-glands but no hair-follicles—escape the irritation, from the watery contents of the sudariparous pores presenting an obstacle to the ingress of the oil.) After a time the hairs on the



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CHRONIC EFFECTS OF CRUDE PARAFFIN.

most exposed parts become atrophic and fall out, but the continued retention of the epithelial masses keeps up the process in the follicles and the induration of the surrounding skin.

The workmen are in the habit of employing "shale spirit" to wash the affected parts, whether with any beneficial effect is, I think, doubtful.

Part Second.

REVIEWS.

Introductory Notes on Lying-in Institutions, etc. By FLORENCE NIGHTINGALE. London: Longmans and Co.: 1871.

THE obstetrical world is proud to number among the contributors to obstetrical literature the justly-renowned Miss Nightingale. Her history and qualifications, both in experience and in mental power, entitle her work to the most careful and respectful consideration, and we are sure that everywhere it will be so regarded.

Although her work is a statistical essay, and is duly hard, angular, and in form sternly logical, yet she does not disdain the use of a graceful drapery which does not interfere with utility. The book is dedicated to Phænarete, and a prayer is added to her great son. The choice of a woman to hold this place of honour at the beginning of the work is balanced by an address to the sex at the end of it; which is, upon the whole, an epitome of good advice in the present stage of the medical education of women. Advice is truly much needed by that obstinate set of ladies who will force themselves on reluctant men, and who seem utterly blind to the truth that, if men are unwilling, they should not be compelled; and the truth that, if any great object is to be gained, it is in every sense best secured by the unaided efforts of those who desire it. Women are at perfect liberty to organize schools, and hospitals of every kind and description; and many men are anxious to help them. But Miss Nightingale is not always, in our opinion, a true interpreter of the feelings of her sex. We believe she is very wide of the truth when she says to women:—"Here is a branch so entirely their own, that we may safely say that no lying-in would be attended but by a woman if a woman was as skilful as a man—a physician-accoucheur." Again she participates in the failings of her sex and of ours, and shows ignorance of the true method of appreciating medical men, when she stimulates women to emulate the Sir James Simpsons and the Sir Charles Lococks, and to get practice among imperial and royal ladies. Two of the most contemptible of aims—a great reputation as a medical practitioner, and attendance on imperial and royal ladies—things which are no index of greatness or of capabilities, and which are snatched generally by men of talents and ambition, who have good fortune, a quackish disposition, and the arts of a lady's maid, who can always simper and dally with truth. The noble men of the profession of medicine are not those of the greatest contemporary reputation, nor are they in attendance on imperial and royal ladies. It is indeed well known that if a practitioner is truly great, and boldly in advance of the weakness and folly of his day, he cannot be highly popular. Men of immense reputation and in attendance on imperial and royal ladies have no time or stomach for laboriously-gained experience, but have the brass of audacious pretension. If Miss Nightingale knew what trash medical practice and medical reputation were made of, she would not speak as she does. The science of medical practice has scarcely been begun. Miss Nightingale does not need to be told what fashionable medical practice must be. Miss Nightingale's book, though well composed, having noble aims, and making several valuable contributions and suggestions on the subjects discussed, will not enhance her reputation as a scientific woman. Through every page we find running some threads of fundamental error, which of course greatly diminish the value and utility of the whole work.

Far from the greatest, but that which most astonishes us, is a moral error, an anti-Christian sentiment, which does not colour her whole book, but crops out at page 89. Speaking of unmarried mothers of a first child, she says, "It would never do, morally, to make special provision for them. And for this very reason we seem bound to receive such, conditionally, into well-regulated lying-in institutions, and afford some kindly care to prevent, at the very least, their sinking lower. But it would not be right to leave any admissions for single women in the hands of any young assistant, or morally inexperienced person." This passage we cannot discuss, but shall satisfy ourselves by turning it into a Christian form. We are bound morally to make the best provision—special provision, if that is best—for unmarried mothers, not only of first, but of subsequent children, and for adulterous mothers; indeed, for all mothers. Kind care should be given, totally irrespective of moral delinquency. The lower or more degraded the object, the greater the charity. Any young assistant who is fitted for admitting married women is fitted for admitting single. We are not aware that the married who enter a lying-in hospital are anywise better than the unmarried. We are sure that every consideration, and equal consideration, should be given to all. Is any sister to be neglected in her time of weakness and suffering, or treated less kindly than another? God forbid that such a sentiment should rule charity.

We now come to an error which is at once medical and logical. Miss Nightingale speaks and argues as if there should be no puerperal deaths, at least no deaths from puerperal diseases. "Such ought never to arise after delivery in a properly constructed and managed institution." We cannot allow ourselves to criticise such nonsense. There are really no conditions known which prevent puerperal deaths. They are the result of puerperal fever, when everything that can be imagined by the most ingenious is most favourable to recovery. No doubt their number may be increased and may be diminished. This every one knows. Miss Nightingale's view is not more unreasonable than would be that of a surgeon who should say that pyæmic deaths should never occur after amputation in a properly constructed and managed institution.

Miss Nightingale is not sufficiently careful as to her facts. She discusses the Waterford Lying-in Hospital without observing that it selects the married, cruelly excludes the unmarried; and that the patients are recommended by subscribers. She in another place boldly contradicts the general opinion as to the high death-rate of unmarried women, giving as sufficient evidence (p. 56) some data of the Liverpool Workhouse, which absolutely prove nothing in regard to it. Comparing workhouse lying-in wards and lying-in institutions, she most erroneously says,—"In both classes of establishments the same attention is doubtless bestowed on ventilation, cleanliness, and frequent change of bedding." We happen to know a lying-in institution which was as filthy and abominable as a Neapolitan prison in the old time. Why does Miss Nightingale not make use of the Dublin Hospital, apparently studiously avoiding what is by far the best mass of evidence for and against her views? We cannot divine. Why does Miss Nightingale not consider and, if possible, refute the bold statement of Stokes, an old, a wise, an experienced man, that the Dublin Hospital cannot be shown to have worse results than occur in the private practices of the best Dublin practitioners? Miss N. is very credulous—carelessly credulous. She, without a word of comment, far less of comforting assurance, tells us that in thirteen London workhouses there were 2459 deliveries, but no deaths in childbed!!! Has Miss Nightingale forgotten that her own normal mortality is a little more than 1 in 200?

The chief error of the book is the last we shall notice. Our authoress desires to improve lying-in institutions, and she virtually states her case in this way:—The normal mortality of lying-in women is 5·1 per 1000: the mortality in lying-in wards is many times the amount of what takes place in home deliveries: therefore, lying-in institutions must be improved or abolished. Now, neither of the propositions is true, and the conclusion is, of course, not just. If she had said that all maternities should be improved, and that many should be either improved or abolished, we should quite agree with her, though the conclusion would not have followed from the premises.

Following the example of Dr Matthews Duncan in his "Mortality of Childbed," etc., she makes the inquiry, What is the normal death-rate of lying-in women? the first step in the discussion. Her conclusion is, that it is 5·1 per 1000, or a little more than 1 in 200. The determination of Duncan is a little less than 1 in 100, and we cannot hesitate, meantime, to prefer the latter. It is impossible to study the induction as conducted by the two authors and escape from this preference.

Miss Nightingale relies mainly on the Registrar-General's data, whose fallaciousness is well known. She truly remarks that the statistics of home-practice are as open to the charge of want of accuracy as those of the Registrar-General or Le Fort. But she forgets that the inaccuracy of the records of private practice can only be in making the mortality too little, not on the other side; that the inaccuracy by omissions in the registers are known, while no such are known in good private records. She ends her argument, whose object is to make hospitals look bad, by reference to the data of Mr Rigden's practice; but she makes this reference utterly vain as a support of her views, by stating that his figures relate only to the first fortnight after delivery. We know many doctors who allege that they have thousands of cases and no deaths, who surpass Mr Rigden!! At the same time, we could adduce large and credible hospital experience, recorded by Miss Nightingale herself, which reveals a success as great as can be well attested in any kind of practice or in any part of the world.

In conclusion, we heartily recommend the work of Miss Nightingale to our readers. We join in her aspirations after improvement in maternities. We recognise her practical knowledge of hospital management in all its details, and the wisdom of her remarks on the administration of these institutions. The architectural sketches which her book contains are useful hints in this department, and will no doubt be duly appreciated.

Essay on Growths in the Larynx. By MORELL MACKENZIE, M.D. Lond., M.R.C.P., etc., etc. London: J. and A. Churchill, New Burlington Street: 1871.

IT is seldom, even in those days of cheap printing, that a book so unexceptionally well got up as the present is offered to the profession. The style and type are excellent, and the woodcuts, engravings, and chromo-lithographs with which the work is profusely illustrated, are remarkable for their softness and finish. The greater portion of these, we are informed, are the production of Mr Lennox Browne, a gentleman of great artistic taste, whose pencil promises to be of eminent service to the profession. It would be difficult to speak of Dr Mackenzie's performance too highly. He has had the necessary experience for writing such a work, and has the power of communicating his thoughts in such a way as to render what he has to say very acceptable to the reader. This in itself is an important recommendation, the more especially when, as in the present instance, the subject is comparatively new and involved. Isolated cases of laryngeal polypus can be traced to the time of Koderik, who operated successfully on one in 1750. It was, however, a century later, viz. 1850, before a complete monograph appeared on the subject. In this year, Ehrmann published his celebrated treatise, "Histoire des Polypes du Larynx," which included 31 cases of laryngeal growth. In 1851, Rokitansky brought forward 10 additional cases; and in 1852, Dr Horace Green of New York published 39 cases. In 1853, Dr Gurdon Buck collected 49 cases. In 9 of those cases only were attempts made to remove the tumours during life. The means of diagnosis and the mode of treatment were alike imperfect, until Czermak perfected the laryngoscope and devised the laryngeal mirror. Czermak, by the aid of the latter, detected a warty growth on the right vocal cord in the beginning of 1859, and since then upwards of 200 cases have been treated. The laryngeal mirror enables the observer to see the true state of the larynx, and to make out in many cases the exact nature of the tumour. It also guides him in his treatment. By this very simple and efficient arrangement, diseases of the larynx have been transferred from the inexact to the exact region of knowledge. The practitioner is no longer called upon to grope in the dark. Considerable dexterity is required in using the laryngoscope, and in operating upon tumours and abnormal swellings and ulcers in the interior of the larynx. The practice, however, is comparatively safe, and will become daily more so in proportion to the number of cases treated, and the dexterity of the operators. In Britain, especially, it is a matter of importance that the interior of the larynx should be under observation. Dr Morell Mackenzie has had unusual opportunities for perfecting himself in this department of surgery. He has had under observation something like 150 cases of growths of various kinds. Of these 100 were treated with the following result: 77 cured, 18 improved, 3 negative result, 2 deaths. The result is therefore in the highest degree satisfactory. Dr Mackenzie has tabulated his 100 cases in a very convenient form for reference, the table giving the date, sex, age, occupation, symptoms, situation, pathological nature, treatment, and result in each case. He has in addition, and at immense labour, appended a record of all the published cases which have been treated since the invention of the laryngoscope in England, France, Russia, Italy, Austria, and Hungary. He has, therefore, gone as fully into the literature as the practice of his subject. Dr Mackenzie has figured the general and microscopic appearances presented by his cases, and also the instruments employed in the treatment, so that neither time, labour, nor expense, has been taken into account in the production of his really admirable work. The book is divided into seven sections. In the first, we have a valuable historical *résumé* of the subject of Laryngeal Tumours; in the second, an enumeration of the Causes which lead to their Formation; in the third, the Symptoms produced; in the fourth, the Diagnosis; in the fifth, the Pathology; in the sixth, the Prognosis; and in the seventh, the Treatment. We have thus a very comprehensive whole. Space will not admit of our giving a detailed analysis of Dr Mackenzie's excellent treatise; nor would liberal extracts from the body of the work convey to the reader an adequate conception of its completeness. The book must be obtained and read. To all those who really take an interest in the scientific advance of surgery, the book is indispensable. It will not be too much to say that the entire profession is under a deep obligation to Dr Mackenzie for his really interesting, instructive, and opportune essay on "Growths in the Larynx."

Personal Experience of Lithotomy in India. By WILLIAM CURRAN, L.R.C.P. Edin. Reprinted from the Dublin Quarterly Journal for May 1871. Pp. 34.

THOUGH we do not often notice reprints, yet we may just tabulate the results of the stone experience of Dr Curran and his friend Dr Grant—the latter's especially being very remarkable. Mr Curran operated on 31 cases, 2 of which died. Dr Grant operated on 112 cases, all by lithotomy. Of these only 2 died, and he had 84 successful cases in succession. Of 193 cases operated on in the Meerut circle during a period of six months, 18 died, or 9·3 per cent. These results are very good.

The pamphlet is illustrated by several drawings of instruments used by the natives, and by a capital picture of a native doctor operating for stone.

A Treatise on Horse-Shoeing and Lameness. By JOSEPH GAMGEE, Veterinary Surgeon, formerly Lecturer on the Principles and Practice of Farriery in the New Veterinary College, Edinburgh. London: Longman, Green and Co.: 1871.

THE great value of the horse in a commercial point of view, and the fact that his value deteriorates in proportion to the unsoundness of his feet and limbs, sufficiently justify Mr Gamgee's attempt to improve the art of horse-shoeing. The direct connexion which exists between horse-shoeing and lameness is so obvious that it only requires to be mentioned. On economical grounds, as well as on the score of kindness to the noblest animal that lives, it is a matter of the utmost importance that the horse be well shod. To shoe a horse well, implies a knowledge not only of the structure and function of the foot, but also of the limb, and by implication of the entire body. In this respect Mr Gamgee is a master in his art; for he has not only repeatedly anatomized the horse, but he has watched and analyzed its movements under all possible conditions. His paper "On the Action of the Horse," in the *Journal of Anatomy and Physiology* (vol. iii.) is simply invaluable. Nor does Mr Gamgee's claim to be regarded as an authority in all that pertains to the foot of the horse and the shoeing thereof stop here. He is eminently a practical man. He has worked with his hands as well as his head—has been apprenticed to Vulcan, and has wielded in his youth the ringing hammer in the glowing forge. He is therefore conversant with all the mechanical details of the craft of the working farrier. Mr Gamgee, in addition to all his head and hand lore, has travelled, and is familiar with the practice of farriers and horseshoers in Italy, France, and other parts of the Continent. He has grown gray in his calling of veterinary surgeon and lecturer, and the book which he now presents to the public, "On Horse-shoeing and Lameness," is the result of fifty years' observation and experience. As his opportunities for acquiring knowledge have been second to none, so his "finished work" will bear a favourable comparison with all similar works, ancient or modern. Mr Gamgee's book is in many respects a masterpiece. It is exceedingly well written, most interesting, beautifully printed, and illustrated by quite a large number of remarkably well-executed woodcuts. The work is very properly divided into two parts; the first part treating of "The Foot and Shoeing," the second of "Lameness." Here we have, as it were, the cause and the effect. In the first part we have an historical introduction of great value, which is followed by chapters on "The Foot; its Form and Functions;" "On Preparing the Foot;" "On making Horse-shoes;" "On Clips, Calkins, and Toe Pieces;" "On Fitting Horse-shoes;" "On Nails, Nailing, and Finishing;" "On Shoeing Horses for the Field and Turf;" "On Plating Racehorses;" "On Frost-sharping or Roughing Shoes." In the second part we have chapters consisting of "Preliminary Observations on Lameness;" "Observations on the Frequency of Lameness in Edinburgh, Birmingham, London, and Paris;" "Pathological Condition of Horses' Feet in Chronic Lameness;" "Special Causes of Lameness;" "Health of Horses regarded in its relation to Affections of the Feet," etc. Such is the design and scope of the work; and it will be observed that the arrangement is at once natural and logical. The author explains the structure and uses of the foot—shows how to prepare the foot for receiving the shoe—how to make and apply the shoe—how a badly-made and badly-fitted shoe will result in lameness—how lameness affects the general health of the horse; and lastly, how lameness and its numerous ills are to be avoided. Mr Gamgee has not sought to evade any of the many difficulties incident to his subject. He has met them fairly and honestly, and has succeeded, in our opinion, in clearing many of them away. The chapters "On the Foot—its Form and Functions;" "On Preparing the Foot;" "On Chronic and Special Lameness;" "On Physiological and Pathological Contributions of great Value;" and then "On Making and Fitting Shoes," must prove unusually acceptable to the farrier and practical horse-shoer. Altogether it would be difficult to speak too highly of Mr Gamgee's work. We have never read a book of its kind more unexceptionably worthy of general acceptance; and we shall conclude our brief remarks with recommending it to the veterinary profession, and to all farriers and owners of horses. It is emphatically one of those books which no country gentleman should be without.

A New Operation for Bony Anchylosis of the Hip-Joint with Malposition of the Limb, by subcutaneous division of the Neck of the Thigh Bone. By WILLIAM ADAMS, F.R.C.S. Illustrated, pp. 68, etc. London: J. and A. Churchill: 1871.

THIS is a very interesting little brochure, on a new operation for the relief of deformity. The author has succeeded in making quite clear what he aims at in the operation, in what cases it is applicable, and how it is to be done. It is for cases of the *bony* anchylosis of the femur in which disease is past, and nature has done her best to cure the case, and failed only in the position of the limb. It is to be tried only in cases where the head and *neck* of the bone still remain entire. It is not suited for cases in which absorption has taken place. Experience and the evidence of museum specimens show that in cases of rheumatic or pyæmic inflammation of the joint, and even in some mild cases of strumous inflammation, anchylosis may take place without any considerable absorption of the neck of the bone. The former cases seem specially suited for the operation. A large subcutaneous tenotomy knife is used to pierce fairly down to the neck of the bone, and, on its being withdrawn, a small but strong straight saw, with a double cutting edge, is introduced in the track of the knife, and, by a process of filing or sawing, the neck of the bone is cut through. The operation is laborious and sometimes tedious. Six successful cases are detailed by the author and other surgeons.

There is a valuable note by Dr Henry Dick on the previous literature of subcutaneous osteotomy, and an appendix, neither very valuable nor very profitable, contains a correspondence between Messrs Adams and Brodhurst regarding the priority of the invention. We think that Mr Adams makes out his case successfully; and that in subcutaneous osteotomy of the neck of the thigh bone he has given us a new and useful means of treatment in some rare cases of deformity.

Notizen und Erinnerungen eines Ambulanz-Chirurgen. Von WILLIAM MAC CORMAC, etc. Aus dem Englischen Ubersetzt and mit Bemerkungen versehen. Von Dr LOUIS STROMEYER. Hannover: Hann'sche Hofbuchhandlung: 1871.

WE had the pleasure of noticing Dr Mac Cormac's work in its English form. We can only say regarding the translation, that Dr Stromeyer seems to have done his part well, and has added some interesting notes as to the manner of dressing wounds, which increase the value of the work. We congratulate Mr Mac Cormac on the honour done him by so early a translation into German.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LI.—MEETING I.

Wednesday, 15*th November* 1871.—Dr BENNETT, *President*, in the Chair.

I. *Dr George W. Balfour* showed TWO CASES OF ANEURISM which had become consolidated while using large doses of the iodide of potassium. The first was Peter Rice, aged 39 when first admitted into the Edinburgh Royal Infirmary on the 29th of April 1867, under the care of Dr Warburton Begbie. He then had a fluidly pulsating tumour, the size of the mouth of a tumbler, to the left of the sternum and above the nipple, with all the other symptoms of aneurism developed to a very distressing degree. On the 1st of August he was transferred to Dr Balfour's ward, and remained under his care till the beginning of the following April, taking large doses of the iodide of potassium all that time.[1] On the 1st of April Rice was exhibited to this Society, just before his discharge from the Infirmary, in a much improved condition. He continued to take the iodide, though somewhat irregularly, for a year afterwards, when his case was again reported to this Society.[2] Subsequently he returned to his ordinary occupation as a mason, and is now supporting himself by day labour in the Edinburgh Botanic Gardens. His symptoms have gradually decreased, till now he is not only free from all pain and uneasiness, but appears florid and robust; no pulsation is to be felt over the former seat of the tumour, while the stethoscope reveals only an obscure thud synchronous with the heart's systole. He is, to all appearance, perfectly cured, and the consolidated aneurism in process of gradual absorption.

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[1] Ed. Med. Journal, May 1868, p. 1055, and July 1869, p. 33.

[2] *Op. cit.*, July 1869, p. 47.

The second, James Wilson, aged 44 when first admitted under Dr Balfour's care on 31st of August 1867. He had an aneurism of the innominata and lower part of carotid the size of a small orange; this is now, and has long been, reduced to the condition of a simple fusiformly dilated artery. He also had an aneurism of the abdominal aorta, which became completely consolidated under treatment by large doses of the iodide of potassium.[1] Since then he has been maintaining himself by daily labour, at first at his old trade of a mason, and latterly by lighter jobs. On the 27th of June 1870, he again came under treatment for a second abdominal aneurism developed above the first. He was treated after the old fashion, and with a similar result: now the artery in the neck is to be felt as formerly, and in the abdomen the small hard nodule of the primary aneurism is to be felt immediately beneath the larger, but equally solid, tumour of the secondary aneurism, the upper end of which disappears beneath the ribs.

II. *Dr Balfour* also showed a man who had come under his care in the Royal Infirmary in July last, labouring under diabates mellitus of between three and four years' standing. He had been treated with lactic acid according to Professor Cantani's method, and had increased in weight from 8 stone 8 pounds to upwards of 11 stone, while all trace of sugar had long since disappeared from his urine, which continued free from it, though he was now upon a mixed diet. This case will be found related at p. 538 of this Journal.

III. *Dr Balfour* also showed a piece of a lead soil-pipe which had been inserted into an iron pipe just below the seat of a water-closet. The iron had been corroded, and a way of escape thus made for the poisonous sewer gases into the house. This specimen had been removed from a house in which two fatal cases of diphtheria had occurred last summer; and Dr Balfour stated that in his experience some such source of gaseous leakage had been invariably found, when sought for, in every house where diphtheria, typhoid fever, and other allied disorders had prevailed.

IV. *Dr Joseph Bell* then showed a young man who had suffered A COMPOUND FRACTURE OF THE RIGHT ANKLE with dislocation, and extensive crushing of the tarsus, from the fall of a stone weighing half a ton from a height of ten or twelve feet. Dr Bell had been sent for to amputate the limb, but after removing the fractured portion of the fibula, preserving the periosteum, and washing out the ankle-joint and all the wound with a solution of carbolic acid and water (1 to 20), he dressed the limb antiseptically and placed it in a Macintyre splint. A rapid and complete recovery ensued, so that in three months the patient was able to walk without a stick and with very little lameness; the limbs are of the same length, and there is considerable movement in the ankle-joint.

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[1] Ed. Med. Journal, July 1868, p. 37, and July 1869, p. 48.

V. *Dr P. H. Watson* next showed:—

1. A CALCULUS WEIGHING 4½ OUNCES, removed by the high operation for lithotomy. The patient had suffered from this affection for twenty years. During that period he had seen several medical men, and by the use of medication had always been relieved. When admitted to the Infirmary, the existence of a large calculus was at once detected. On cutting him by the ordinary lateral operation, the size of the stone, and its round form, rendered all prudent efforts at its extraction perfectly futile—the calculus slipping again and again from the grasp of the forceps, which peeled off large scales of the superficial layers. In these circumstances, with the approbation of his colleagues, Dr W. operated by the hypogastric incision, and effected the removal of the calculus with some little difficulty, the bladder embracing the stone so closely as hardly to admit of its passage through the aperture in the anterior and superior aspects of the viscus. The calculus consisted of lithic acid, lithic salts, and a small amount of phosphates. The patient had made a complete recovery.

2. A CALCULUS, WEIGHING 1½ OUNCE, removed by the ordinary lateral operation from a boy æt. nine years. The case presented no special features of interest, except the size of the stone, the facility of its extraction, and the rapidity of the patient's recovery.

3. FRAGMENTS OF A CALCULUS, WEIGHING 3 DRACHMS, removed from a patient, æt. 70, by lithotrity, at a single operation.

4. THE LEFT SUPERIOR MAXILLARY BONE, affected with medullary cancer of two months' standing. The case had been recommended to Dr W.'s care by Dr Wannan of Arbroath. The disease originated over the anterior aspect of the maxilla, but had recently extended upwards, involving the floor of the orbit, displacing the globe upwards and forwards. The appearance of parts militated very much against any interference, but the history of the case indicated that the disease was still confined to the superior maxilla. To determine the extent of orbital invasion, the first part of the operation consisted of making an incision through the conjunctiva and orbital fascia beneath the globe, so as to introduce the finger and explore the limits of the orbital disease. This showed that nothing beyond the orbital plate of the maxilla was involved. The incision through the conjunctiva was carried inwards to the inner canthus, and outwards, through the commissure, to the malar margin of the orbit. From the inner extremity of this incision another was carried downwards by the ala of the nose through the upper lip. The flap thus defined, including (as will be observed) the under eyelid, was turned aside carefully from the prominent surface of the tumour. The osseous attachments of the nasal and

malar processes of the superior maxilla were then cut through, and a saw introduced into the nostril cut the bone across just above the line of the alveolar process. By careful pressure of the fingers introduced into the nostril, the whole mass was then displaced outwards and downwards. The patient has gone on satisfactorily, and the thinned cutaneous surface of the cheek dissected from the surface of the tumour has retained its vitality.

5. A SPECIMEN OF MELANOTIC CANCER OF THE LEFT CHEEK, invading the maxilla, and requiring extirpation of the whole of the soft parts of one side of the face, below the margin of the lower eyelid, as far as the angle and base of the lower jaw. This was effected, along with the anterior and outer surface of the superior maxilla, to which the cancerous growth was attached. To occupy the gap, the cutaneous tissues from one side of the forehead and scalp were raised as a large flap, and transferred to the gap, while a dissection of the soft parts on either side on a lower level, enabled them to be approximated. This patient has made as satisfactory progress as could be anticipated within a week after the operation.

6. A LARGE CYSTIC TUMOUR OF THE THIGH-BONE, extending from below the middle of the bone to the middle of the neck. The case occurred in a patient æt. 70. The patient was submitted to amputation at the hip-joint. The flap had to be obtained by dissection of the cellular cutaneous tissues from the anterior and posterior surfaces of the tumour. The bleeding was controlled by the aorta tourniquet. The patient survived the operation a fortnight; during that period most careful antiseptic dressing, together with every precaution, was employed, but the patient sank, hiccough developing itself for three days before death.

7. A CASE OF MELANOTIC SOFT CANCER OF THE RIGHT ARM, on account of which amputation was performed at the shoulder-joint. This patient had originally a single tumour, situated over the insertion of the triceps, which had been removed elsewhere, on an antecedent occasion. The disease had recurred both in the cicatrix and also in a series of apparently detached tumours, one of which corresponded to the supra-trochlear gland, another a little above this point, and another at the insertion of the deltoid. As the disease seemed limited to the level of the parts below the insertion of the deltoid, with the approval of Dr Handyside, who placed this patient under Dr W.'s care, amputation was practised below the tuberosities of the humerus, but as the inner flap-margin presented a dark purple patch, the head and neck of the humerus were extirpated by extending the incision upwards between the coracoid and acromion, and then dividing the soft parts perpendicularly through the floor of the axilla. The case had healed kindly.

8. A LARGE FIBRO-PLASTIC OR RECURRENT TUMOUR, WEIGHING 4 POUNDS, removed recently from the abdominal parietes of a female patient. The tumour had existed since its detection for only eight months. In removing this mass, the external surface of the peri-

toneum was laid bare to an extent corresponding to about half a square foot. This patient has made a good recovery.

9. The parts removed in EXCISION OF THE EXTREMITY OF THE HUMERUS in a case of comminuted fracture of the articular extremities of the humerus, radius, and ulna. The accident had occurred some months before, when the patient (about twenty years of age) fell thirty feet and lighted on his elbow. The peculiarity in this case was that the anchylosis which had resulted was treated not by excision of the elbow-joint, but by excision of the articular end of the humerus. The operation Dr Watson claimed as an original and new one for these cases. It is performed by a linear incision over the inner side of the olecranon in the line of the ulnar nerve. The nerve is dissected away with the soft parts till they can be turned over the inner condyle. The joint is then opened freely in front of the condyle, and the condyle cut off by bone-pliers. The external condyle is then cut off by the bone-pliers applied through the same opening in the other direction (*i.e.*, from within outwards and from below upwards), and twisted out of its bed with lion forceps. The end of the humerus is then turned out and smoothed off with the saw. The advantages claimed for this operation are—(1) the non-interference with the insertions of the *triceps* and *brachialis anticus ;* (2) the more perfect restoration of the elbow-joint in its various movements, lateral and backward flexion being preserved.

10. AN ANGULAR WEDGE OF BONE removed from the site of the knee-joint in a case of old-standing rectangular anchylosis of the articulation. The case had terminated most successfully with a straight limb, upon which the patient, an adult male, could bear his weight in walking without assistance. In straightening the limb the hamstring tendons required division, and some old-standing cicatrices adhering to the bone were removed, so as to leave nothing but sound pliant textures to cover in the site of operation.

11. THE TUNICA VAGINALIS AND TESTIS removed from a patient, whose case simulated the conditions of strangulated scrotal hernia. The history and diagnosis of the case were the features of chief interest. According to reliable statements there was no swelling in the morning, but about 12 noon the patient complained of a sickening pain in the region of the scrotum. This part was found to be swollen and acutely tender, extending upwards along the cord, and accompanied with pain in the abdomen and sickness, but no constipation. The surface of the swelling was red and glazed, the cord at the external ring was thickened, but its normal elements could be recognised unchanged. The testicle was undistinguishable. This swelling was tympanitic upon percussion. Efforts had been made at taxis, but unavailingly. Dr Watson's diagnosis was fœtid abscess of the tunica vaginalis. He cut down carefully upon the sac, and, opening it cautiously, gave vent to a quantity of gas and stinking sero-pus. On emptying the vaginal sac the testicle was exposed, communicating with its cavity by a

small opening in the globus minor of the epididymis. The case was obviously one of abscess of the epididymis bursting into the tunica vaginalis and giving rise from its putrescent contamination to acute effusion and the other local and general symptoms. As the testicle was manifestly the site of tubercular disease, and the whole tunica vaginalis was in a sloughing state, Dr Watson cleared the cord; and, stripping away the tunica vaginalis and testes from the scrotal tissues from above downwards, he divided the cord. After securing all bleeding vessels he approximated the raw surfaces of the scrotal tissues.

12. THE ASTRAGALUS, EXTREMITIES OF THE TIBIA AND FIBULA, WITH PART OF THE OS CALCIS, removed by a single J-shaped incision from the foot of a female who for many years had suffered from disease situated between the astragalus and os calcis.

13. THE EXTERNAL MALLEOLUS AND ASTRAGALUS from a male patient in middle life, removed on account of abscess of the astragalus. The same incision was employed as in the former case.

14. THE EXTERNAL MALLEOLUS, ASTRAGALUS, THE GREATER PART OF THE OS CALCIS, together with a paring of the SCAPHOID and CUBOID BONES, on account of disease commencing between the astragalus and os calcis. Operation by same external incision.

15. THE ASTRAGALUS AND EXTERNAL MALLEOLUS from a child, removed on account of disease situated in the astragaloid joints. Removed by the same external incision.

16. THE ASTRAGALUS AND EXTERNAL MALLEOLUS in a patient upwards of fifty years of age, removed on account of disease affecting the articulations between the former and the os calcis. Removed by the same J-shaped external incision.

Dr Watson stated that in all these cases the progress had been most satisfactory, but as they had all been performed recently it was impossible to speak confidently of the absolute results. In the two last cases, which had been first operated upon, the patients could walk comfortably and support their weight upon the affected limbs without adventitious aid.

VI. *Dr Joseph Bell* then read his paper entitled CASES OF VESICO-VAGINAL FISTULA, which will appear in an early number of this Journal.

Dr Parker, from Nova Scotia, remarked that he had heard Dr Bell's paper with the greatest interest. He had frequently made use of Marion Sims hooks, and valued them highly. He believed, however, that Dr Bell would find, in regard to an instrument for introducing the needles, that there was nothing equal to the forceps invented by Dr Sands, of New York, which worked at any angle. He very much regretted he had not a pair to show, as he had accidentally lost that which he had brought with him. He regarded Dr Bell's cases as extremely interesting and very satisfactory. He himself had been utterly foiled in one case from sheer inability to find the vesical opening on account of its small size and tortuous course. A similar result had also attended an attempt made elsewhere to operate on the same patient. He considered that to carry the sutures through both mucous surfaces was perfectly correct in principle. Marion Sims had at first sternly prohibited this; but there was no doubt that such a procedure was not attended by any danger, and was often most useful.

Dr P. H. Watson regretted that the paper had been so concise in its details in regard to operations which presented such grave difficulties, and in which success had only been attained by so great an expenditure of time and patience, as well as the employment of much surgical skill. He believed that in regard to instruments and method of procedure every surgeon preferred his own, but as no two cases were ever exactly alike, the means had always to be adapted to the end desired and to the circumstances of each individual case; the tendency of modern surgery was, however, always to greater simplicity. He concluded by expressing great satisfaction at the success attained, especially in the first two cases.

Dr Handyside read a concise account of a similar, but unsuccessful, operation which had been performed by Dr Vartan, medical missionary at Smyrna. He hoped that Dr Bell's success might excite Dr V. to another attempt, which he trusted might have a more gratifying result.

Dr Craig stated that Dr Bell, in reading his paper, had made so many allusions to instrumental labours, that he would be glad to know whether Dr B. attributed the formation of the fistula to the use of the instuments, or to the lingering labour which necessitated them. He would also like to know how long after the conclusion of labour the fistula was observed?

Dr Bell replied that he was totally unacquainted with the *ars obsteterica*, but he believed that Dr Thomas Emmet, whose experience in such cases was very large, attributed it to the lingering labour, the fistula not discovering itself till some days after the conclusion of the labour.

Dr Matthews Duncan stated that a fistula only rarely declared itself at once, as it must do if it depended on instrumental injury, its appearance being delayed till after the separation of the slough originating from a lingering labour. This operation was one in which a very ordinary surgeon could attain a fair amount of success, provided he selected easy cases, where the vagina was soft and free from cicatrices or deformity. And yet even these cases were a triumph of modern surgery. Fifteen years ago, when Marion Sims first published his pamphlet, a distinguished surgeon, whose opinion regarding it he had asked, pooh-poohed the whole operation, and insisted that none were ever cured. Yet, but a short time subsequently, he (Dr D.) himself was successful in curing a large vesico-vaginal fistula. Cases thus, which but a few years ago were utterly despaired of, were nowadays constantly and successfully operated on. Cases, however, in which there was much cicatricial tissue in the vagina, and in which the openings were numerous and tortuous, taxed the skill and patience of the most careful and able surgeon, and even after he fancied he had cured a case, he often found he had to begin his work over again. He himself had cured one patient twice over as he supposed, and, after all, she had to be finished by Dr Bell, on account of a trifling leakage from a small opening near the spine of the ischium. In all cases the important parts of the operation were thoroughly to pare the edges and retain them in close apposition. And after all the ingenuity displayed in inventing buttons and splints of every different curve, he believed that the simple measures recommended by Marion Sims were by far the best. The principles of thorough paring and close apposition were not only applicable to vesico-vaginal fistula, but also to all plastic operations on the perineum or connected with recto-vaginal fistula; and it was a great glory to Marion Sims that, after all the quill and button sutures that had been invented during these many years, his simple plan still remained the best. He was surprised to hear, however, that it was now considered quite proper to pass the sutures through both mucous membranes, a proceeding which he had hitherto avoided, but which might certainly simplify operations under a variety of circumstances.

Dr Parker stated that vesico-vaginal fistula was not always due either to lingering labour or instrumental interference. He had seen them follow natural labour which had not lasted more than twelve or fourteen hours, and where no instruments had been used.

VII. *Dr George W. Balfour* then read his paper, entitled NOTES ON THE TREATMENT OF DIABETES BY LACTIC ACID (CANTANI'S METHOD). This paper is published at p. 533 of the present number of this Journal.

Dr Bennett said that, in regard to the pathology of diabetes, the great difficulty was to discover the organ in fault. The stomach, the liver, the lungs, and the nervous system had all been blamed by turns, but as yet no one had succeeded in showing which was really to blame. Dr Donkin, of Sunderland, had recently published some remarkable results attained by the use of a diet consisting entirely of skim-milk. One patient, who could with difficulty walk only half a mile, after one month's treatment consisting solely of a diet restricted to skim-milk alone, of which from eight to ten pints were taken daily, was able to walk seven miles without resting, and without fatigue or any ill consequence. In another case, after skimmed milk had produced a satisfactory result, new milk had apparently caused a return of the disease—a result attributed by Dr Donkin to the oleaginous matter which he believed capable of forming sugar in the system. Dr Donkin's cases had, however, been too few to establish anything, and the same might be said of Dr Balfour's. But if the members of the Society were to co-operate in regard to the treatment of this disease by Cantani's or Donkin's method, a large and valuable body of evidence might speedily be collected.

Dr Smart stated that some years ago he had made an extensive series of observations in regard to the production of glucose. He had employed new milk amongst other articles of diet, and had found it to be one under which the sugar most rapidly disappeared from the urine. He had accordingly placed it at the bottom of the list of articles of diet arranged according to their sugar-producing properties. These observations had been published in a concise form in the *Medical Times and Gazette* for 1863. He could not see why any preference should be accorded to skim-milk over new milk, especially as the latter was certainly the more nutritious of the two, and the mere addition of fatty matters, he had ascertained, tended to lessen the production of sugar. The lactin of milk, he had ascertained, did not pass into glucose, but rather into lactic acid,—the success of a milk diet therefore rather helped to confirm Cantani's views.

Dr G. W. Balfour, in reply, said that the great beauty of Cantani's treatment was, that it was a matter of no importance to ascertain what the organ in fault was—it was a treatment based on physiology rather than on pathology. Whatever the organ at fault might be, it was simply deprived of its pabulum, and thus placed as completely as possible at rest, while the actual product of its normal action was artificially supplied to the organism. The organ at fault was thrown completely out of gear for the time, all the other functions proceeding, nevertheless, in a perfectly natural manner. After a time the organ was again and gradually supplied with its natural pabulum, and thus restored to its natural position in the ordinary physiological sequence, when it was frequently found to have re-acquired its normal condition. As to the use of milk as an article of diet in diabetes, Headland, in his work on the Action of Medicines, recommended in his first edition (1852), "That some such substance as pepsine or the decomposing caseine of sour milk, which is capable of effecting this change out of the body," should be administered with the view of endeavouring to transform the glucose into lactic acid, which he considered the great problem to be solved. And in his second edition (1859), he states that he had read to the Medical Society of London an essay recommending the use of fresh milk as an article of diet, as it seemed that milk sugar was not liable to be turned into glucose, or to be excreted by the urine; while at the same time he recommended the administration of a smaller quantity of sour milk as a therapeutic agent, for the reasons already stated. He also mentioned that this treatment had been adopted in several cases with much success. To Dr Headland, therefore, we owe the introduction of a milk diet as a treatment for diabetes, as well as a clear recognition of the fact that lactic acid is the therapeutic agent wanted. Dr Smart had, however, confirmed Headland's view quite independently, and by his careful researches had contributed to our knowledge of the dietetics of glycosuria.

Part Fourth.

PERISCOPE.

Penetrating Wounds of the Chest. By Dr Revillout.—Penetrating wounds of the chest by bullets have been generally severe, and in most instances fatal. M. Gosselin has a case at present, however, whose left lung was pierced through and through by a bullet, and who is now nearly well. A vast collection of blood mixed with air formed at the time, then suppuration began; and probably there were previous adhesions between the pulmonary and parietal pleuræ.

The anterior wound was two or three finger-breadths below and behind the nipple; but as the ball had gone from below upwards, and from before backwards, the posterior wound was too high to give free discharge to the matter. M. Gosselin made a free counter-opening on the level of the anterior wound, and passed a drainage-tube from the one to the other. In four days this was removed, and the discharge diminished, and the wounds are rapidly closing.

Here the entrance of air seems to have had none of the bad effects attributed to it, nor in two other cases of suppurating pleurisy, without wound, in which M. Gosselin has obtained cures by free opening before and behind.

M. Champenois showed to the Société de Chirurgie 24 patients in whom he had successfully treated fractures by gunshot of the upper extremity—8 of the shoulder, 11 of the upper arm, 4 of the elbow, 1 of the forearm.

Dislocation of the Scaphoid. By Dr A. Dubreuil.—In a recent clinical lecture, Richet discussed the possibility of such an accident. Broca had denied the possibility, and stated that it could not be produced on the dead body. Richet said that the bedside had often showed accidents which had been declared to be anatomically impossible. This is illustrated by the following cases:—Chassaignac, in 1860, dissected a distinct case of this accident, and gave an account of it in the *Gazette des Hôpitaux* for 1860, p. 247. I have lately dissected another. It was in a man of forty, brought to the anatomical rooms, without a history. There was no cicatrix in the skin, but the right foot was altered as follows:—Only about three-fourths of the astragalus was in its usual relation to the ankle-joint—the whole bone having been moved forwards, and the head of the bone was on a considerably lower level than usual. A distinct dislocation of the astragalo-scaphoid joint was visible; instead of being placed transversely, the scaphoid is directed obliquely downwards, and to the inner edge of the foot. Its posterior articulating surface with the astragalus is double instead of single. The head of the astragalus, instead of resting in its depression on the scaphoid, rests on a thick fibrous bundle, representing the inferior calcaneo-scaphoid ligament, which had doubtless been torn. The calcaneo-cuboid joint, and those between the scaphoid and cuneiforms, presented no unusual features. Not the slightest evidence of fracture was present.

These facts show the possibility of a dislocation between the astragalus and scaphoid, without any loss of the usual relations of the astragalus to the bones of the leg or to the os calcis, or between the cuboid and os calcis.—*Gazette des Hôpitaux*, No. 63.

CASE OF STRANGULATED HERNIA, in which the intestine was punctured and air withdrawn, with remarks and discussion.—*M. Dolbeau* reports the following case:—B., æt. 59, entered hospital for the treatment of an aggravated condition of disease of the heart. He also had a reducible hernia. This, some days after admission, without any special reason, became painful, and the patient soon showed all the classic symptoms of strangulated hernia, and was sent to the surgical wards of M. Dolbeau. The heart symptoms were by this time very urgent and alarming. This hernia was as large as a turkey's egg, in scrotum and in inguinal region, painful, hard, and resonant to percussion.

The patient seemed so weak that M. Dolbeau thought it useless to operate, but next day (the fifth since any fæcal evacuations had been obtained) the patient was a little better, so that M. Dolbeau thought of trying puncture and tapping of the intestines. Two punctures were made by the smallest needle of M. Dieulafoy's instrument,—the first obtained only some reddish fluid mixed with fæces; the second also a quantity of fluid. The tumour was diminished in size, and taxis succeeded in reducing more than half of it into the abdomen; the remaining half was not painful, and seemed omentum only. Faradization of the abdominal muscles was then used, and in four hours a stool was obtained, which was soon followed by a second. The patient unluckily died of his heart-disease in the evening. An examination of the body showed that the hernia had been reduced, and that the puncture of the intestine had not caused any communication with the peritoneal cavity. The portion of intestine was removed and inflated with air; not a single bubble of air escaped, and the intestine remained distended.

M. Boinet remarked that he had never performed the operation of puncture for hernia, but had often done in abdominal tympanitis, even five or six times in one month on the same individual. He had never seen any harm result from the punctures, which were quite innocent if performed with a sufficiently fine needle. Air and fluid can escape without causing effusion into the peritoneum, as the little aperture is at once closed by the contraction of the walls of the intestine.

M. Lâbbé thought M. Dolbeau's communication very interesting. M. Dieulafoy's instrument was better suited than any other needle or trocar. He had done it in a case of peritonitis after ovariotomy, and there was no peritoneal effusion. He had on another occasion made a different use of the needle. A patient had retention of urine, and an enormous infiltration of urine in the perineum. The catheter could not be passed, but by the syringe the water was completely drawn from the bladder. After death the puncture was found to leave no trace of its presence, nor to have caused any escape of urine.

M. Tarnier referred to a paper he had published, in which he had recorded several cases of intestinal strangulation treated by puncture of the intestine.

M. Giraldes referred to a sealed packet which he had some time before deposited with the president, in which a series of observations on puncture of the intestine in strangulated hernia were recorded. He had often done it, both in children and adults.

M. Blot had punctured the intestine with a flat needle so long ago as 1855, in a case in which cæsarian section had been performed, and peritonitis with distention had occurred, and a lump of intestine had protruded. This could not be returned from its size till punctured. The patient died next day. Yet no trace whatever of effusion into the peritoneum from the needle-wounds could be found. It is possible to puncture the intestine with a fine instrument without any danger of effusion into the peritoneum.

M. Verneuil had never performed the operation, and had some doubt of its efficacy on physiologico-pathological grounds. The intestine in these cases is paralyzed as well as strangulated, and the puncture would not have any effect in remedying the paralysis. The subject gives an opportunity of mentioning a method of the taxis in which compression of the neck of the sac is added to the ordinary pressure on the hernial tumour itself with great advantage.

M. Trelat related two cases of hernia he had recently operated on with success after eleven and fifteen days of strangulation respectively. How to account for such an unexpected result? His opinion was, that in these cases the patients had not really suffered from *strangulated* hernia, but from hernia in which adhesions between the bowel and omentum had caused an arrest on the course of the fæces.

Gosselin, in his Lectures on Hernia, describes adhesions, but thinks that they are rarely causes of accidents, as they are almost always soft, and merely the result of the peritonitis which accompanies the strangulation. In my two cases the intestine did not show the ring which generally is caused by the neck of the sac, but had adhesions which caused me to separate bowel from omentum by a careful and delicate dissection. The adhesions bled when separated in the first case so as to require perchloride of iron, and the second to resist even that styptic, and to require the use of the hot iron to several bleeding points.

M. Lâbbe thought M. Trelat's cases most important, and he agreed with him in his pathology. He had operated with success in a female of 82, in whom he had to dissect many adhesions between intestine and omentum, which bled so much as to require perchloride of iron. He described another case in which symptoms of strangulation had gone on to a fatal issue, without the existence of real strangulation, but only the presence of adhesion between bowel and omentum.

M. Giraldes had lately seen a case of hernia in which the intestine had been strangulated in a sac of omentum. Had this been reduced *en masse* the patient would have been unrelieved. This condition had been recognised and well described by English surgeons.

M. Liegeois described a case in which he had opened a cavity from which gas with a fæcal odour escaped, so that every one thought it was intestine, and the edges of it were stitched to the wound. The vomiting continued, no fæces escaped, and a future operation showed that the bowel had not been opened at all, but that it was gangrenous from being tightly strangulated by the cribriform fascia.

M. Despres mentioned a case of hernia in which Boyer had opened skin, sac, omentum, and bowel at once, they being all thin and adherent. Without destroying the adhesions or reducing the hernia he stitched up the wound, and the patient got well. The accident which M. Liegeois described had happened to many good surgeons. *Gazette des Hôpitaux*, Nos. 73, 75.

CASE OF POPLITEAL ANEURISM. By M. Duplay.—We give a very brief abstract of a case which is told in the original at considerable length.

D., a bookseller, æt. 49, had noticed five years before admission that, in walking, his right leg was more easily tired than the left, was œdematous, and, occasionally, there was pulsation in the ham. In two years more the pulsation became more evident, with a distinct tumour in the space. On admission, the tumour in the popliteal space of the right leg is soft, fluctuating, and compressible, with every symptom of aneurism, as large as a fist. The limb was emaciated. The patient complained of pain, and walks with his limb bent and toe pointed. The patient seemed to be in good general health, nor was there any indication of cardiac lesion.

April 28. After having given tincture of digitalis internally in moderate doses, treatment was commenced by forced flexion of the leg upon the thigh. This at once stopped pulsation in the tumour, but was so painful as not to be borne beyond a few minutes at a time. In time he learned to bear it for twenty minutes at a time, and this two or three times a day. After a fortnight of this no improvement took place; digital compression was also used, at Poupart's ligament, for three hours daily. In another week, still no improvement took place; so a serious attempt was made at digital compression. This had to be abandoned at the end of ten hours, in consequence of the insupportable pain it caused in the thigh. In three weeks another attempt was made for sixteen hours, which had to be stopped for the same reason as before, without having cured the tumour; but next morning the pulsation seemed less, and the tumour seemed to be a little harder. This improvement in hardness persisted for some days, but the pulsation remained as vigorous as ever. Again, after the interval of a month, digital compression was tried for thirteen hours with no appreciable benefit; so on the 2d of August, more than three months after treatment had commenced, the femoral artery was tied at the usual place, the apex of Scarpa's triangle. Everything went well except that the artery continued to pulsate so close to the seat of ligature that a hæmorrhage was feared, which occurred on 22d August, the twentieth day after the operation, with considerable violence. The wound was opened, and the artery again tied about an inch higher than before. Pulsation, however, soon returned close up to this ligature, notwithstanding the use of pressure, so on 31st August the external iliac was also tied in the usual manner, after which everything went well; the femoral ligature coming away safely on the fifteenth day, and that from the external iliac on the eighteenth day after their application. The aneurism was also slowly cured.—*Gazette des Hôpitaux*, No. 77, 1871.

Part Fifth.

MEDICAL NEWS.

The Sewage Question.—On 13th November Dr Andrew Fergus, President of the Social and Sanitary Section of the Glasgow Philosophical Society, delivered in the Corporation Buildings the opening address. The Hon. the Lord Provost presided, and introduced Dr Fergus, who said that he would principally confine his remarks to the evil effects produced on the inhabitants of cities by the way in which excreta were disposed of, and inquire whether there could be any improvement. He maintained that there was no waste in nature; that the refuse of one order of organized beings was food for the other; and that if there was waste we were living contrary to nature, and the results would be most disastrous, the true rotation of nature being from the earth to plants, from plants to animals, and back to the earth again. We had not followed this rotation, but had passed our excretions into the river. He adduced proof that these and other organic matters were the chief cause of the pollution of the river, and showed that the river itself was not injurious to health, however shocking it might be from an æsthetic point of view. This must be kept in mind by those gentlemen who wished to purify the river, and at the same time reduce the death-rate. They must begin by preventing the decomposition of excreta and other organic matters in the sewers where were generated gases capable of producing disease. Fresh excreta were not injurious to health; it was only when they decomposed that they were injurious, and the most favourable circumstances for this decomposition were that the excreta should be placed in narrow passages with a limited supply of air and water. In fact, our cesspools and sewers were ingeniously contrived chemical laboratories for the production of sewer gas. He pointed out that the connexions between the sewers and the houses were in many cases faulty and imperfect, both as water-closets, sinks, and fixed basins, and showed that to ventilate sewers was both costly and difficult. Even then we had not destroyed the gas, but simply diluted it. Having given instances of how very little sewer gas would produce typhoid fever, he remarked that gas was always being formed, and being generally lighter and frequently hotter than air, it was in a state of tension to escape at the highest openings. Dr Fergus pointed out that the reappearance of some latent epidemic, viz., diphtheria, might possibly be owing to our having taken into our system either by air or water the results of excremental pollution, and adduced proof of this assertion from the medical officers' report to the Privy Council. Dr Fergus exhibited a number of soil-pipes eaten away from within, apparently by the action of sewer gas, the perforations being generally in the upper surface. Emanations therefrom, he said, had in some cases been proved to be the direct cause of disease. He mentioned that a few years ago an outbreak of typhoid fever took place in an institution, but disappeared so soon as the pipes were renewed, and had not since manifested itself. Plumbers rarely, if ever, detect this state of pipes, as they looked for leakage, whereas the perforations being generally in the upper surface, there could be no liquid leakage. A pipe was exhibited which had been taken from a house where typhoid fever existed, and although the whole water-closet had been recently renewed, the plumber had failed to discover this state of pipes. The diseases resulting from such pipes had been, so far as he could notice them, typhoid fever, diphtheria, diarrhœa, etc. Chemical works had been blamed for this condition of things; but these pipes he had found in every water-closet town, and the worst specimen on the table had come from Edinburgh. As regards the duration of soil-pipes, we must particularly separate between ventilated and non-ventilated ones. By the former, he meant pipes carried up to the tops of the houses, and really open to the external air; and by the latter, pipes which were not open to the external air. The duration of the latter might be stated to be about twelve years—the extreme variation being from a minimum of eight years, to a maximum of twenty years. The duration of ventilated pipes might be set down at double that of the other, being twenty to twenty-three years; and for the extreme variation, from eighteen to thirty and thirty-five years. Wherever there was typhoid fever, diphtheria, or diarrhœa, the whole of the soil-piping should be uncovered and inspected, especially in the upper surface. Other diseases arising from excremental pollution were diarrhœal, including cholera. The latter was generally acknowledged to be the direct result of taking into our system the results of excremental pollution. The excess of the diarrhœal death-rate in England was in all places coincident with either tainting the air with the production of organic decomposition, especially human excrement, or the habitual drinking of impure water. He pointed out the value of the excreta, and the folly of ransacking the whole earth in pursuit of phosphates and guano, and throwing away that which was produced by ourselves, creating a nuisance, and poisoning the people. He adversely criticised sewage irrigation, and said that it never had yet been applied to the whole sewage of a large city. There were three conclusions to which he had come in considering this question: (1), that no excreta should be allowed to get into a sewer, water-course, or river; (2), that all organic nitrogen and carbon—that is, putrescible matters, refuse from manufactures, etc.—should be kept out of our sewers, water-courses, or rivers; (3), that all excreta should be submitted to chemical or other action by which they would be rendered non-putrescible. This would require an Act of Parliament, and we must not go alone for it, but have a conservancy board, including representatives from all the towns and burghs that poured their refuse into the river. If such a board carefully excluded all offensive matters, the rivers—the Clyde, for instance—would become as pure as formerly. Having pointed out several modes by which this could be done, Dr Fergus remarked that if one-tenth of the skill and ingenuity, and one-thousandth part of the money, which had been bestowed upon our water-carriage had been devoted to investigations in this direction, the problem would have been solved long ago, and a large profit derived.

EDINBURGH SCHOOL OF MEDICINE.—The winter session of the School of Medicine was opened on 1st November with an address from Mr Annandale, delivered in the lecture-room, Surgeons' Hall. Dr

Halliday Douglas, President of the Royal College of Physicians, presided; and there were also present—Mr Walker, President of the Royal College of Surgeons; Drs Strethill Wright, Borland, Rattray (Portobello), Inglis, J. A. Hunter, John Smith, Joseph Bell, Chiene, Matthews Duncan, P. D. Handyside, Stevenson Macadam, Angus Macdonald, Argyll Robertson, P. Heron Watson, John Miller, and Bailie Miller.

Mr Annandale's address is published at page 497.

On the motion of Dr Halliday Douglas, seconded by Mr Walker, a vote of thanks was given to Mr Annandale for his address.

University of Edinburgh.—Inaugural Address by the Principal.—The winter session of the University began on 1st November, and was inaugurated by an address from the Principal, delivered to the students and the public in Queen Street Hall. There was a large attendance. The students were accommodated chiefly in the body of the hall, and the public, including a number of ladies, in the galleries. Sir Aexander Grant was accompanied to the platform by the members of the Senatus Academicus.

Professor Kelland opened the proceedings with prayer.

The Principal's admirable address, which appeared in the newspapers of the day, commenced by congratulating the University on its increasing prosperity, of which he adduced satisfactory proofs. He also congratulated the University on the creation of a degree in Engineering, and on the addition of two new chairs, that of Geology, due the munificence of the late Sir Roderick Murchison, and that of Commercial and Political Economy, due to the enlightened liberality of the Merchant Company of Edinburgh, and on the acquisition of two men so distinguished in their several branches as Professor Geikie and Professor Hodgson.

He then went on to say that the greatest obstacle which the University has to encounter—lying in the way of our doing service to the nation at large—is the obstacle of poverty, which cramps our action, obliges the continuance of monopoly in teaching, and drives away to the richer pastures of the south the best intellects among our rising scholars. All this might have been different had the Town Council, during the two and a half centuries when they governed the University, had the foresight to purchase for it now and again a piece of land, as they did so effectively for Heriot's Hospital. Had this been done, the University would now have been in the position of sharing in what is called "the unearned increment" of wealth; the resources of learning would have been fed by the results of the progress of society, and would have been able to meet the demands ever increasingly made upon them. As it is, the University was handed over by its late rulers in pauper plight. A not very liberal grant from the Treasury was so distributed by the Commissioners as to leave most of the Professorships absolutely dependent on a compulsory curriculum and a monopoly of fees; and my friend the Dean of the Faculty of Arts gravely warned us last April against rashly meddling with those arrangements. The general fund of the University, which is all we have to look to for current expenses, consists of matriculation and graduation fees, added to the income derivable from the munificent bequest of General Reid; but the total amount is so barely sufficient for our purposes, that if by an increase in the fees during any one year an additional £50 or £100 be obtained, numerous rival claims for the money are at once preferred by different Professors, who are each able to show an urgent want of additional apparatus, class assistants, or other means of teaching. Indeed, had it not been for the good General Reid, I do not see how the ordinary work of the University could have been carried on. I give publicity to these facts in order that our real position may be known. Great as is the benefit conferred by gifts for special objects, such as bursaries, fellowships, and the endowment of chairs, I believe that what this University most of all requires, and what would do most to promote her usefulness, would be an addition to her general fund—gifts, whether in the shape of money or of lands, for general University purposes. It can hardly be doubted, gentlemen, that we are now on the eve of a new era in the histories of the Universities of Scotland. The most important of the changes which the immediate future seems to have in store for us is the reformation of the secondary schools of this country. It must excite wonder to reflect how long this much-needed measure has been delayed. Three hundred years ago, an excellent system of graded education for Scotland was planned by John Knox, but half of his scheme was never carried out; and ever since, while other countries have been constantly improving their educational systems, it is not too much to say that Scotland has remained apathetically content with a set of secondary schools, inferior, as a whole, to those of almost every civilized country. And it is not for want of protests and warnings on the subject that this has been the case. My friend Professor Blackie may claim the honour of having persistently lifted up his voice, and prophesied the truth on this matter. Nothing could be more clear or strong than the terms in which, in a letter addressed by him to the Town Council of Edinburgh, and published sixteen years ago, he exposed the low state of learning in the secondary schools of Scotland. But his words were received with a deaf ear. Professor Blackie is one of the most popular men in the community. (Laughter and applause.) The public listens to him, admires him, and laughs with him. But in his more grave and serious utterances, it suffers him to bear the fate of a Cassandra. Neither Town Councils, nor Churches, nor any bodies in authority, have ever seemed to take to heart his assurance that the one thing needful, before all others, for Scotland, is the improvement of the upper schools. This is entirely a question for the middle classes, and for the great mass of the nation, because the highest classes in Scotland have long been used to get out of the difficulty by sending their sons over the Border for education. But now, since the middle classes of Scotland make no sign of reforming their burgh schools, or of entertaining any conception what such schools ought to be, I think that there is some hope of our seeing them reformed by Government. The Education Bill for Scotland of last session, which was probably lost only through the peculiar circumstances of the session, contained clauses for bringing the burgh schools, as well as the primary schools of the country, under legislation. They were to have been placed under the administration of elective school boards; and this, I doubt not, would have been a step in the right direction. Yet still it may be questioned whether, as in England, the secondary schools ought not to be dealt with in a separate bill from that which deals with primary instruction. It is only quite recently that the Liberal Government of England have begun to abandon those economical fallacies with which they have so long been hampered—that the State has no concern with secondary education—that State education is a form of the out-door relief of paupers—that the taxpayers' money must never be devoted to assisting a man to rise out of the station in which he was born. There are manifest symptoms that these ideas are vanishing, and that a principle directly contrary to them will take their place—namely, that in every well-ordered State the very poorest should have opportunities given him of rising to any station for which his intellectual abilities may qualify him. In Scotland, the first steps of this rise have always been favoured by the parish schools, but the subsequent steps have been rendered difficult by the missing link between the parish schools and the Universities — by the want of distinctively secondary schools, adequately provided with exhibitions and bursaries for the maintenance of the most talented of the youth of the country during their period of instruction. It remains now for the Government to supply this missing link—first, by inquiring how far the rich educational endowments of Scotland, which have hitherto been greatly misapplied, and devoted to pauperizing a section of the people, may be made available for the elevation of Scotland's indigent but gifted children; and secondly, by taking measures to fill up from Imperial resources whatever may be still wanting for this purpose. When this has once been accomplished, there can be no doubt that the Universities of Scotland will take a new start. When the *élite* of the country come to us, duly prepared in high-class schools, and able to pass an examination on entrance equal to that of the *Abiturienten examen* of Prussia—(and why should they not? are the Scottish youth, as Professor Blackie asked sixteen years ago, entirely inferior in intellect to the Germans?)—when this state of things is introduced, the University of Edinburgh, at all events, will be very different from what it is now. (Loud applause.)—The benediction was pronounced by Professor Kelland, and the meeting separated.

EDINBURGH VETERINARY COLLEGE.—The winter session of the Edinburgh Veterinary College was commenced on 1st Nov., and the introductory address was given by Principal Williams. Bailie Miller, in the unavoidable absence of the Lord Provost, presided; and among those present were Bailie Howden, Dean of Guild Russel; Messrs Thomas Grieve, V.S., Manchester; James Taylor, V.S., Oldham; Hunter, V.S., Newcastle; Balfour, V.S., Kirkcaldy; Robinson, V.S., Greenock; Spreole, V.S., Dundee; Romanes, V.S., Leith; Hutcheon, V.S., Edinburgh, etc.

The Principal, in the course of his address, gave an outline of the history of veterinary art, and next sketched the rise of the Edinburgh Veterinary School, paying a grateful tribute to the memory and skill of its founder, Professor Dick. He made reference to the non-recognition by endowment of Veterinary Colleges by our Government, and went on to discuss the commercial equivalent given to those who employed veterinary surgeons. The learned Principal then went on to refer to the great spread of contagious diseases among horned cattle. When it was remembered, he said, that in 1869 an Act of Parliament was passed to prevent the diffusion of such diseases, one was inclined to ask whether they were contagious at all, or if they were not rather due to some subtle atmospheric influence. He was of opinion, and that opinion was strengthened by experience, that such diseases were introduced into this country and diffused throughout the length and breadth of the land by contagion only; and that the Act of Parliament was not sufficiently comprehensive to deal with the question. He saw from the *Scotsman* that a local authority had to be prosecuted for neglecting to carry out the provisions of the Act. Nor was this to be wondered at when they knew that not only cattle, but sheep, pigs, and even turkeys, were seized with foot-and-mouth disease by contagion. It was also a well-known fact that babies who drank the milk of cows attacked by foot-and-mouth disease were seized with the same disorder; but it might be stated that if the milk was boiled before use, no evil consequences would arise to the children. Without entering into further details in regard to the Act of Parliament and these contagious diseases, he might suggest the propriety of an early conference of the members of the veterinary profession to consider what should be suggested to the Government as the basis of a new Act, or of alterations in the present one. In conclusion, the Principal welcomed the students to another year's work, and inculcated the duty of hard and earnest study, both in the class-room and in the byre and stable.

Bailie Miller expressed the indebtedness of all present to Principal Williams for his excellent address, and stated that, without derogating in the least from the character of the past history of the College, the institution was at the present moment in a highly flourishing condition, and possessed a staff of professors second to none in any other Veterinary College in the country. (Applause.)

He then introduced to the students Mr Davidson, the new Professor of Anatomy, and Mr Whally, the new Professor of Cattle Pathology.—A vote of thanks to Bailie Miller for presiding terminated the proceedings.

SIR ROBERT CHRISTISON, Bart., M.D., President of the Royal Society of Edinburgh, twice President of the Royal College of Physicians, Physician in Ordinary to Her Majesty for Scotland, and a Professor in the University of Edinburgh of nearly fifty years' standing, and of world-wide fame, it is scarcely an additional honour to Sir Robert to be made a baronet. But as a public and well-deserved recognition of valuable academic services, of that sterling integrity and high sense of honour which have procured for him that powerful influence among his kind which is everywhere felt and acknowledged, and of those great services to science which are not less real that they are in danger of being forgotten amid the turmoil of ceaseless and rapid progress—as such, this honour has been welcomed with satisfaction by all his friends and admirers. The science of toxicology, now one of the most certain branches of forensic medicine, is based entirely on the researches of Christison and Orfila. And after Bright—and scarcely second to him—it is to the inquiries of Christison that all our modern knowledge of diseases of the kidney is mainly due. As a diligent worker and successful teacher, Sir Robert Christison has well won his baronetcy, but he has deserved it even more by the respect which his sterling honesty of purpose has secured for him with every one who has come in contact with him during his long and useful public career, and we trust he may be long spared to enjoy in a green old age that honour which has been nobly gained by a life devoted to the best interests of mankind.

EDINBURGH OBSTETRICAL SOCIETY CONVERSAZIONE.—The opening of the 31st session of this Society on the 8th Nov., was inaugurated by a *conversazione*, in its Hall, 5 St Andrew Square. The invitations issued by the President and Fellows included the names of the practitioners in the city and county, and most of the corresponding Fellows in Scotland. In addition to the Fellows of the Society present, we observed Professors Maclagan, Lister, Spence, Sanders, Balfour, etc., Drs Littlejohn, Thos. Keith, Dycer, J. Smith, etc.

The guests were received by the President, Dr Charles Bell, who opened the proceedings by introducing Dr Keiller to the meeting, as a former President of the Society, who had been selected by the council to deliver an address. The subject chosen by Dr Keiller was, the "Progress of Obstetrics." The time allowed for the lecture did not permit the lecturer going deeply into the subject. He therefore took a comprehensive but necessarily cursory glance of the great subject, dwelling occasionally on some of the more important steps in the progress of obstetrical science. He also referred to the dangers the accoucheur and surgeon were occasionally exposed to in the exercise of their duties from actions being raised against them for mal-practice, but time did not permit him entering upon the merits of the recent case at Stockton-on-Tees, in which he gave evidence for the defender. Referring to the success of ovariotomy, he alluded in complimentary terms to the grand results of our Edinburgh operator, Dr Thomas Keith, and, before concluding, paid a tribute of respect to the memory of Simpson, a name ever well received in this Society.

On the motion of Professor Maclagan, seconded by Dr Turnbull of Coldstream, a cordial vote of thanks was awarded to Dr Keiller for his interesting address. The company then adjourned to another room, where refreshments were provided, and instruments and preparations were exhibited.

Amongst the exhibitors connected with the Society were, Professor Simpson, Dr Keiller, Dr Matthews Duncan, Dr Macdonald, Dr Young, Professor Inglis (Aberdeen), and Dr Ritchie. Professors Sanders and Turner exhibited a series of preparations of injected uteri and placentæ of the lower animals. A variety of obstetrical instruments by various inventors were also exhibited, and a pleasant and instructive evening was spent by the company.

THE ROYAL MEDICAL SOCIETY had its session inaugurated by an able address from Dr Andrew Wood, who reviewed the history of the Society, pointing out, what has been so often previously insisted on, that all its eminent members had in after years become distinguished members of the profession, and illustrating this theme by a long muster-roll of names, from Benjamin Rush down to Sir James Simpson. Dr Wood's address was well calculated to stir the youthful mind, and will, we trust, be followed by a numerous accession of new members to this the oldest and most famous of our medical societies.

SIR WILLIAM STIRLING-MAXWELL has been elected Lord Rector of the Edinburgh University.—MR DISRAELI has attained the same honour in Glasgow.

MATRICULATION AT EDINBURGH UNIVERSITY.—The number of students matriculated at this University for the current session 1871-72 up to this date (24th Nov.) is 1690, of whom 692 are matriculated in the Faculty of Arts, 53 in the Faculty of Divinity, 333 in the Faculty of Law, and 612 in the Faculty of Medicine, and of the last number, 212 have registered themselves as first year's students in the Faculty of Medicine.

WE have the pleasure to record that DR JOHN ROSE CORMACK, the founder and first editor of the *Edinburgh Monthly Journal of Medical Science*, has received the cross of Chevalier of the Legion of Honour from the French Government for his courageous and devoted services during both sieges of Paris. Dr Cormack has also received the war medal, and the cross of the Société Française de Secours aux Blessés.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Procidentia of the Pelvic Viscera.* By J. MATTHEWS DUNCAN, M.D.

UNDER this heading we propose to treat various forms of one affection, various species of one genus. It is certain that, when one organ or viscus is procident—that is, is displaced beyond the natural limits of the pelvic cavity—it is not alone, but other organs accompany it. In the present state of our knowledge, it is a mere accident which organ is primarily procident, or is alone procident; and it is this accident which guides practitioners in naming the species of this great disease, the procidentia of the pelvic viscera.

The procidentia of the uterus is, for evident reasons, the grand procidentia; and the reader may keep this in view when no special procidentia is named.

When the uterus is procident—that is, when it temporarily or permanently lies external to the vaginal orifice, in whole or in part—the procidence is not of the uterus alone, but of the pelvic viscera. When the uterus is procident, the bladder, rectum, vagina, tubes, and ovaries, are all carried in a greater or less degree in the same direction along with it. It must be so. The uterus occupies a central position among the pelvic viscera; it is large, readily felt and seen, and procidence of the pelvic viscera not unnaturally gets the name of uterine procidentia. The other pelvic viscera are not procident merely because the uterus is so. The organ which is most movable is most or primarily procident, if any organ can be said to be primarily procident when all descend more or less exactly together. The uterus is not only central, but, in the majority of cases, also most mobile, and is therefore very frequently the primarily procident organ. In many instances it is the bladder which is the primarily procident organ. In few only is it the rectum. In still fewer is it the vagina.

Procidence of the pelvic viscera includes many diseases, which get distinct names from peculiarities of the procidence. They are,—procidence of the uterus through the vagina, commonly called procidentia uteri; of the vagina itself, commonly called prolapsus vaginæ; of the bladder through the vagina, commonly called vaginal cystocele; of the bladder through the urethra; of the posterior wall of the vagina, with or without the adjacent rectal wall, through the vaginal orifice, commonly called vaginal rectocele; of the rectum through the anus, commonly called prolapse of the rectum; of the uterus through the anus. All of these affections, and some others, have many points in common, probably nearly an identical etiology; but, in speaking of procidentia of the pelvic viscera, we shall under that designation refer only to procidence of the uterus, vaginal cystocele, and vaginal rectocele, or combinations of them.

This procidence is a common affection—a stock disease with the gynækologist. It is seen in its most aggravated forms only among the poor and hard-working. It is, however, in its minor forms, or in its threatenings, very common in all classes. It specially affects women who have borne children, and more especially women who have had large families. It is commoner among the elderly than among the young, but it may occur at any age.

Among twenty-two cases of procidentia, whose ages I have noted, two were aged respectively 15 and 17; three were aged respectively 60, 62, and 65; three were between 25 and 30; two between 30 and 35; five between 35 and 40; two between 40 and 45; one between 45 and 50; two between 50 and 55; two between 55 and 60.

In twenty-one cases I have noted the number of children born to the sufferers. Four had had no children; two had had 1; two had had 2; two had had 3; two had had 4; one had had 5; one had had 6; three had had 7; two had had 8; one had had 13; and one had had 14 children.

In the course of my remarks I shall say almost nothing of the minor degrees, or early stages of procidentia. These have been investigated chiefly so far as they affect the uterus, and get often the names descent and prolapse. They are frequently complicated by, or frequently (not always) consist in, states of retroversion, retroflexion, anteversion, anteflexion of the womb. Many modern and especially British authors flatter themselves that these last-named uterine conditions are discoveries of recent times—of the last thirty years; but this is far from being the case. In recent times much attention has been paid to them, and considerable additions made to our knowledge of them. Modern and especially British authors can justly lay claim to little more than to the discredit of attaching to these minor displacements an exaggerated importance—an importance for which they can even now adduce no evidence worthy of the name.

We shall now proceed to examine the condition of the parts which are prolapsed, and we shall suppose that we have before us the common, well-marked cases in which there is a large projection between the thighs.

The bladder is invariably procident if the uterus is so, and this follows from the intimate connexion between the two organs. They do not slip one upon or over another; both must go together. The bladder, or rather the lower or vaginal part of it, is frequently the only organ or part of an organ procident, vaginal cystocele; and in this case the uterus descends towards the floor of the pelvic cavity in whole, or its cervical portion chiefly, this part being elongated. The bladder is generally not even irritable; sometimes it is so, and the urine may be ammoniacal, and contain mucus and pus. The walls of the bladder are slightly thickened and hardened. The fundus of the bladder is displaced downwards, but not nearly to the same extent as its vaginal portion. The displacement downwards of the fundus of the bladder varies, and in this respect it has some correspondence as well as analogy with the uterus. The lower part of the bladder lies beneath the vaginal wall, covering the whole projecting mass in a case of vaginal cystocele, or beneath the anterior vaginal wall in a case of uterine procidentia. Wherever the uterine cervix is, there is the bladder in close apposition to it, in front.

I have seen it stated that a great French pathologist believes cystocele may take place without downward uterine displacement. I have never seen such a condition; and as I have not seen a circumstantial account of the occurrence, which is admitted to be excessively rare, I am not disposed to place much confidence in the assertion.

The rectum is sometimes, even in cases of great uterine procidentia, almost unaffected. Its connexion with the vagina is much looser than the corresponding connexion anteriorly of the bladder and vagina, but its connexion is still sufficiently close to make it impossible to believe that its position is quite natural in a case of large uterine procidence. Yet the fact remains that its displacement in these circumstances is sometimes so inconsiderable that the finger introduced through the anus discovers no downward pouching of the anterior wall into the procident mass. In many cases of large uterine procidentia, however, there is such pouching easily felt. But the descent of the rectum is much less than that of the bladder. Vaginal rectocele is less common than vaginal cystocele, yet it is not rare. It differs from vaginal cystocele in being occasionally the solitary well-marked displacement. Vaginal cystocele is often, indeed generally, the first step of uterine procidentia; it is always accompanied by uterine descent. Vaginal rectocele sometimes occurs without any other extensive displacement. Piles may be absent; they are seldom large.

The vagina is the organ most affected in the procidentia. If one organ were called to give a name to the procidentia of pelvic viscera, in its common forms, the vagina deserves such place. In all great procidences it covers or invests the whole procident viscera. It becomes hypertrophied when it has been long procident, especially in its inferior parts, that is, those parts which are normally superior. Its rugæ get smoothed out. It is of a pale reddish colour, which may approach dark purple if the congestion is considerable. It is little sensitive. When the procidence is permanent, the vagina, or rather its mucous membrane, is often inflamed. This inflammation is said to end often in ulceration, sometimes even in sloughing and the consequent formation of vesico-vaginal or recto-vaginal fistula. These inflammations and ulcerations are often extensive, often in patches. They are said to be produced by friction and by the irritation of urinous irrigation.

The whole subject of these inflammations and ulcerations demands renewed study. I am quite sure that friction and urinous irrigation are not the causes of the inflammation and ulceration. The position of these ulcerations is sufficient of itself to show the error of this *a priori* notion. Indeed I am satisfied that, in the majority of instances, friction and urinous irrigation have little or nothing to do with it. No doubt extensive ulcerations are often seen. But for many cases the whole of this pathology is a series of errors. Many of these so-called ulcerations, how many I do not know, are not what they appear to be. They are red inflamed parts, covered by a pellicle of lymph or diphtheritic membrane, whose contraction raises around the red portion a redder and prominent margin, which increases the likeness of the whole to what is known on the skin as a callous ulcer. This diphtheritic pellicle may frequently be raised and peeled off. Sometimes it dries and forms a translucent, horny, hard, elastic plate, which becomes at last spontaneously detached and thrown off. That this is the true pathology of many so-called ulcerations of the vagina and cervix uteri in cases of chronic procidentia I am sure, for I have carefully observed and verified instances. Perhaps it is the pathology of most. I have seen a case of procidentia with a small superficial ulcer become diphtheritically inflamed on a considerable surface, including that which was ulcerated. Then gradually, within twenty-four hours, a lymphy pellicle has been formed over it, covering up the ulcer and its neighbourhood with a whitish tough layer, which soon thickened to the dimensions of a thick croupy membrane. This membrane I have observed to contract and raise the edge of healthy mucous membrane surrounding it. I have peeled it off and discovered the ulcer and the inflamed mucous surface below the membrane. The parts so denuded have been again covered with the diphtheritic membrane. As time has advanced, the membrane loses its white appearance, and becomes dirty gray, like the base of a callous ulcer. All this has gone on without the patient's having anything like the constitutional disease called diphtheria, indeed without any grave disturbance of the health; but this point I have not attended to with sufficient minuteness. The final termination of these diphtheritic inflammations may, no doubt, be ulceration.

I have already said that, when the anterior wall of the vagina descends, it always carries the bladder with it and the uterus also, at least to some extent. When the posterior vaginal wall descends it may descend extensively—not wholly of course—alone, without any evident descent of the uterus or of the rectum.

When the vagina is chronically procident, it becomes, where not ulcerated, hard and dry, with a pale yellow-red tint. It is said to be like skin, but in truth the likeness is not very close, as any one will find who examines.

The urethra has its direction changed. It passes directly backwards from the external orifice towards the cavity of the bladder. Not unfrequently it has a curvilinear shape, with the concavity looking downwards.

The os uteri is unchanged in young virgins, especially, I believe, if not yet begun to menstruate, and in old women who have the uterus atrophied; and I suppose that in these cases the atrophy has preceded the procidentia. No doubt the ordinary condition of the os in procidentia is that of wide openness, partly from hypertrophy of the lips of the os, and partly from separation of them by the vagina pulling on them. This separation leads to an extroversion of the arbor vitæ. The os is generally filled by transparent colourless cervical mucus, but the mucus may be opaque from age, or it may be muco-purulent, or it may be tinted with blood or mixed with blood. Sometimes the os is temporarily closed by lymphy or diphtheritic exudation, which covers it and adjacent parts more or less extensively.

In most cases of procidentia uteri, the os, gaping, with its darkened, moist surfaces, which are often ulcerated, is a prominent feature. But in virgins and old women it has sometimes to be looked for, being small and having nothing about it to attract the eye of the spectator. Indeed I have known it to escape observation, and error in diagnosis to occur in consequence.

The lips of the cervix may be unchanged or simply flattened out in cases occurring in young virgins and in very old women. Sometimes they are nearly healthy even in menstruating women. But generally—that is, in the great majority of cases—they are greatly turgid and hypertrophied, sometimes ulcerated and much everted. The lower or projecting part of the cervix then has a great bulk, equal in circumference to that of the largest hen's egg, and assumes a very alarming appearance. Not very rarely one or more mucous polypi are attached to it. Hypertrophic elongation of the infra-vaginal portion of the cervix sometimes takes place.

When the whole uterus is frankly procident, the mass of the cervix uteri may be unchanged. This simple simultaneous procidence of the entire uterus is not rare. But it is more frequent for the procidence not to affect all parts of the uterus equally, and then the exaggerated procidence affects the cervix. If the cervix is to be further procident than the body of the organ, it must be elongated: it cannot separate itself from the body. The elongated body of the cervix does not hypertrophy: it is consequently thinned, and the fingers grasping the prolapsed mass feel the cervix within it like a hard cord as thick as the little finger, joining the infra-vaginal portion to the uterine body. As the bladder is generally procident before the uterus, it is the anterior uterine wall that is generally first and chiefly pulled upon, and in the early stages may be exclusively or chiefly elongated. The amount of elongation varies. An ordinary amount is to the length of nearly four inches. The elongation is, to some extent, like the stretching of an elastic substance, and partially disappears when the organ is replaced. I have seen it described as entirely disappearing; but this is certainly a mistake,—I have found a uterus which was elongated to six inches reduced only to four inches, after a week of replacement and rest in bed.

The body of the uterus is always displaced downwards to some extent, but frequently its prolapsus is arrested while its cervix and other viscera continue to descend, the cervix becoming elongated and accompanying the latter. In four cases out of thirteen in which I noted this point, the uterus descended frankly, the length of its entire cavity from os externum to fundus being 2½ inches or less. In one woman, æt. 40, its length was only 1 inch, the uterus being either congenitally very small or else extremely atrophied. The most frequent length of the entire uterine cavity I have found to be 5½ inches. But I have observed it 3½, 4, 4½, 5, 5½, 6, 6½ inches, in cases which were uncomplicated. In complicated cases it may be longer.

The uterus may be adherent to the neighbouring parts. It may contain a fibroid or fibroids. It may be adherent to an ovarian tumour. When frankly procident it may be retroverted or retroflected within the procident mass.

The ovaries must be displaced downwards. I have generally found it impossible to make out their situation during life. But occasionally I have felt one or both descended far into the pelvis, by searching for them with the finger introduced per anum. They are generally situated near the fundus uteri, and often a little above it.

The bowels descend with the fundus uteri in cases where that part is only inconsiderably prolapsed. But they rarely form part of a procident mass, descending only to fill up the void in the upper part of the pelvic cavity. When they come lower they fill up Douglas's space and increase the bulk of the procidentia.

The peritoneum is of course displaced with the organs which it covers. The commonest great change is the increased depth of Douglas's space, the peritoneum occasionally reaching down behind the cervix nearly as far as the bladder does in front.

The uterine and vesical ligaments are all put upon the stretch, and altered in position and direction according to the position of the parts to which they are attached.

The mode of production of procidentia of the pelvic viscera may be compendiously observed in any case of chronic procidentia. The procident parts are replaced, and the woman is asked to bear down and again protrude them. Thus a displacement which may have taken years for its gradual first production may be reproduced before the eyes of the observer in a minute or less; and the general course of the reproduction is the same as that of the original production, except as to speed. Mechanical forces gradually or quickly produced it at first; the mechanical force of bearing-down rapidly reproduces it after replacement, and at desire.

Eminent gynækologists, chiefly French, maintain that it is impossible to make a satisfactory vaginal examination, or at least a complete one, without performing it while the woman stands in the erect posture. This is rarely necessary. Of course, if it is desirable to know the exact condition, as to place, of the pelvic viscera while the woman is standing, then the examination should be made while she is in this position. But for all practical purposes, in the great majority of cases, the usual position on the left side is the most convenient; and, generally, it is in no cases more convenient than in cases of procidentia. If the vulva is exposed and the organs are replaced, then the procidence can be conveniently reproduced by bearing-down effort; and the same is true not merely of procidence but of every degree of prolapse. I have never known a case of procidence which the patient could not easily reproduce while lying down, by bearing-down effort. Indeed, bearing-down will easily reproduce a procidence which is not reproduced at once by standing or walking; the bearing-down being a more powerful force than the depressing force produced by the erect position maintained for a short time.

If, then, cases are so studied, the following observations are made:—Most frequently the bladder is first protruded, bulges largely; the uterus, following in a rough way the axis of the pelvis, clothed with soft parts, then comes to protrude, the cervix jerking over the anterior edge of the distended perineum; then the whole mass, including bladder and very little of rectum, is procident. The bladder so advancing may be accompanied by all the parts of the uterus simultaneously; but generally the uterus does not so follow frankly, but, being reluctant, has the tissues of its cervix stretched and elongated, and the uterine body then only makes a comparatively small amount of descent, remaining within the cavity of the pelvis. It not very rarely happens that, instead of the mode of production above described, another is followed. The uterus, frankly, or with all its parts simultaneously, descends; its cervix presents at the os vaginæ and is the part first procident, the uterus being primarily procident; then the whole pelvic organs descend together as the large and complete procidentia is formed. Occasionally, instead of the modes of production above described, a different one is followed. The posterior wall of the vagina first protrudes at the vaginal orifice; it may be alone or to some extent, seldom largely, accompanied by the rectal wall; then the bladder may follow, or the uterus may be procident before the bladder; and lastly the complete procidence is performed.

In slighter cases of procidentia, the bladder alone, or the posterior wall of the vagina alone, or the recto-vaginal wall alone, may be procident. In these cases there is generally some prolapse of the other pelvic viscera; always, so far as I have observed, when the bladder descends; not always to any marked degree when the recto-vaginal septum or the posterior vaginal wall descends.

When the body of the uterus is fixed and does not descend, as may be the case when it has extensive adhesions to parietal peritoneum or to an ovarian tumour, or when it is enlarged by a fibroid, then the descent may take place as already described, with this exception that the uterine body does not fall. In these circumstances the uterine cervix may become elongated; but probably the most frequent procidentia is of the posterior vaginal wall, in these circumstances.

A great French author of last century described the function of parturition as purely mechanical. So I regard the production of the various procidentiæ which I have been describing. Their cause is purely mechanical, as is that of the birth of a child or the production of a hernia. Indeed, this procidentia may be classified as a genus of the great family of herniæ. When I said that bearing-down efforts, reproducing the procidentia of recently replaced pelvic organs, gave the process of production in epitome, I meant the statement to include the etiology. The mode of original production is not in every respect exactly imitated, nor is the cause of the rapid reproduction identical with the original cause; it is not voluntary bearing-down alone which produces procidentia, but it is mechanically caused, the causes being in their nature truly imitated by bearing-down.

The purely mechanical nature of the cause of procidentia is well illustrated in the early history of many cases. Then, as is well known, the simple change of position from standing up to lying down is sufficient to produce replacement of the organs—to produce temporary cure. A mere mechanical change, standing up, does in these cases produce the disease: a mere mechanical change, lying down, cures it, for the time.

There is no doubt that, in the immense majority of cases—probably in all chronic cases—the causes which produce procidentia have been long acting, gradually elongating the attachments or so-called ligaments of the displaced organs, and gradually stretching and elongating the organs themselves, or parts of them. No doubt a violent effort may produce a procidentia suddenly; but such procidentia will disappear as suddenly if the woman has no natural proclivity to the disease; and if she has such natural proclivity, the violent effort has only hastened what was otherwise likely soon to occur. If a uterus is pulled down violently by the surgeon, he must exert great force, and he brings it only as far as the vaginal orifice. The greater the speed with which he brings down the organ, the greater the force he must use. In the dead subject, a force of from 20 to 50 lbs., or even more, may be required to produce a prolapsus by pulling down the uterus. Probably quite as great force is required to produce a sudden procidentia or prolapse in the living female. The womb pulled down in the living or dead female, or suddenly pushed down, resumes its natural position when the displacing force is withdrawn. In most cases of procidentia, the displacing force is comparatively slight, but slow in its action. The uterus, like the fœtus, may be expelled quickly by strong pains or forces, or more slowly by weak ones.

I have placed side by side the etiology of hernia and procidentia, and I believe these two affections have close relations. When the retentive power of the abdomen is gradually or suddenly diminished, or when its contents are powerfully compressed, then the weakest part will, of course, yield, if any part yields. In this way, piles are often gradually formed, or a hernia is suddenly or more slowly produced, or the pelvic viscera descend, and, the cause continuing, may ultimately become prolapsed or procident. In this way, piles, prolapse of the rectum, herniæ, may be accidents which may be called alternative—the occurrence of one taking the place of the occurrence of the others. This subject may come to receive support from statistics of these various diseases. For instance, it may be shown that herniæ are more common in males than females; and this may be accounted for by the descent of pelvic viscera in woman affording the alternative for many herniæ in males.

The uterus is often and justly described as to some extent a floating organ. The forces which, in their just equipoise, maintain it in its natural position, and maintain, likewise, the other pelvic viscera, may be deranged in two ways. The elevating or retaining forces may be in excess; and then the uterus and other organs are drawn high up, unnaturally elevated. This is often seen, so far as the uterus is concerned, in old age. The retaining forces may be diminished, or the expelling forces may be predominant: then the uterus and the other organs will descend. That which is most easily displaced will descend first, and the rest will follow in the exact order, and in the exact direction, of the facility with which they may be depressed. The so-called ligaments of the organs may be sufficient permanently to resist the depressing forces: generally they only offer a temporary resistance. They are all composed of structures which yield under continued tension, and yield to a great extent. Relaxation of so-called ligaments is, and must generally be, an effect, not a cause, of procidentia.

The causes to which prolapse and procidentia are usually ascribed are, either powerful expelling forces, such as bearing-down, lifting heavy bodies, hard work, whose action is easily comprehended, or are conditions which weaken resistance to the downward course of the viscera. Among the latter are child-bearing, diminution of fatness, menstruation, leucorrhœa. Fat in great quantity in the anterior abdominal wall generally prevents prolapse, increasing the retentive power of the abdomen. Laceration of the perineum is often adduced as a cause of procidentia; but it acts exclusively by facilitating the occurrence, shortening the route which the descending organs have to describe, and removing the last barriers to their morbid progress.

The symptoms of procidentia of the pelvic viscera are well worthy of study, and the most remarkable fact, not rarely verified, is that there are no great or serious symptoms. Of course women suffering in this way are distressingly aware of the procidence, and must be great sufferers from the physical annoyance of the morbidly situated parts; but it is not rare to find they have no other complaint. The presence of other symptoms may be elicited from them; but it not rarely happens that the physical annoyance and the symptoms combined press so little upon the poor woman that she either cannot be, or is with difficulty, induced to have anything done for her relief; and this is not the ordinary behaviour of sufferers from female complaints.

The most common complaint is of the discharges from the procident viscera. Then, a considerable proportion complains of difficulty and sometimes of pain in making water. Irritability of the bladder is not frequently observed. A frequent complaint is of pain in the back, and pain or feeling of dragging in the loins, extending often downwards into the thighs. Difficulty in defecation is not frequently complained of, but it is often present, and specially liable to be great in cases where there is anterior pouching of the rectum and constipation of the bowels.

Women suffering from any degree of procidentia are often in the habit of supporting the parts while urinating or defecating. They find assistance from so doing, as is easily understood. In cases of relaxed rectum with procidence of its anterior wall through the vagina, defecation may be almost impossible, unless the procidence is repelled during straining at stool. Of course, the difficulty occurs only when the stool is not soft, and the difficulty increases with the hardness of the elongated cylindrical fæcal mass. So great does this difficulty become at times, that the fæces have to be scooped out of the rectum by the finger or other appropriate tool, as the handle of a tablespoon. The cause of the difficulty of passing hard fæces is easily understood by reference to the physiology of this part of the function of defecation. The course of the fæces, which, above the sphincter ani, had been forwards and downwards, becomes at that point somewhat abruptly changed to nearly directly downwards, and the well-constituted healthy rectal tube directs the fæcal mass as it ought to proceed. But if, just above the sphincter, the rectum is relaxed, especially if, either during defecation or at all times, there is pouching of the anterior wall of the rectum in that situation, then the fæcal mass, instead of being guided downwards to the anal orifice, passes onwards into the vaginal rectocele, and is pushed, as if it were to be evacuated through it. I have been told by intelligent women suffering from vaginal rectocele, of this tendency of the stool to force out the rectocele, and of the comparative facility of defecation when the rectocele was repressed.

On the diagnosis of procidentia I shall say almost nothing. Mistakes are impossible, if due care is taken, even by the most inexperienced practitioner. Yet I have known errors to occur, polypi and vaginal cysts being mistaken for procidentia. The facility with which the positions, absolutely and relatively, of the bladder, uterus, vagina, and rectum, can be ascertained, renders any grave mistake inexcusable, at least under any circumstances that I can at present imagine. To describe diagnosis would be merely a dry recapitulation of physical changes, and is unnecessary.

If the preceding account of the etiology of procidentia is true, then the theory of the treatment is simple. It is a mechanical treatment, or a treatment with mechanical objects in view. But although the treatment is in theory simple, it is beset with practical difficulties. There is ample room and verge enough for skill and ingenuity; scope also for the exercise of highest wisdom. Is engineering to be the method resorted to? Is anything or nothing to be done? If engineering is required, what should be done, and how should it be done? Engineering in a living female is more difficult than in dead matter.

For practical purposes, cases may be divided into the slight and the aggravated. Slight cases are those wherein the disease is only temporary or occasional, and those where the procidentia is only to a small degree at the worst. Aggravated cases are those where the procidentia is great, and is, if not the permanent, at least a frequent condition.

Slight cases must always be regarded as likely to become aggravated if not appropriately treated. Slight cases may be treated without any extraneous mechanical appliances. Aggravated cases demand one or more extraneous mechanical appliances. These are the T bandage, a pessary, and a perineal operation. At one time an ingenious operation was proposed (and I have tried it), which might have been serviceable in both slight and aggravated cases, but the advantages expected from it have not been realized. It consisted in separating the connexions of the coccyx on the one side, and the sphincter muscle and perineal central fibrous raphe on the other. Its object was simple and intelligible. It was hoped that the lowest or anterior part of the floor of the pelvis, over which the descending viscera have to pass, would be elevated. The uterus, for example, instead of sliding down a smooth inclined plane to the vaginal orifice, a plane leading forwards and downwards from the apex of the sacrum, would then, near the apex of the sacrum, meet with a plane inclined somewhat upwards, and so inclined as to assist in barring further morbid progress.

It is easy to understand how, in slight cases, slight remedies may act beneficently, satisfactorily, and efficiently. Among these slight remedies are maintenance of the horizontal position for weeks, especially avoidance of long standing; regulation of the bowels, especially securing their easy evacuation; avoidance of hard work, such as lifting heavy weights; the arrestment of leucorrhoea or menorrhagia, or any other means of strengthening the vaginal canal, doing away with relaxation; the diminution of the weight of the uterus or of its cervix; any means of increasing the retentive power of the abdomen.

The maintenance of the horizontal position for some time may act advantageously in a variety of ways. Ligaments which are elongated when the uterus descends, or tissues which are relaxed or stretched, may get time to acquire shortness or density, while the viscera are, by the recumbent posture of the woman, prevented from assuming a morbid position. The uterus, especially after recent delivery or miscarriage, may get time to lose weight, and therefore tendency to descend. Congestion of vessels, which may tend to injurious relaxation, may be cured.

Straining at stool or in urination always aggravates a procidentia. Many women think it is the cause of the procidentia, and to a great extent they think justly. Many women never have procidentia except when straining at stool. The avoidance of this then is an evident gain; and for its avoidance the knowledge and skill of the physician are taxed. He should produce soft, easily-discharged, regular stools, by medicines or dietetic regulation, avoiding the general evils entailed by the habitual use of powerful laxatives.

Hard work, such as lifting heavy weights, is a cause of the most aggravated procidentia. There is no doubt that in the early history of many such cases, the evil might have been averted by the avoidance of this cause of it. The continuance of hard work renders the cure in all cases extremely difficult and insecure, in some cases impossible. Poor women, finding themselves unable to procure a livelihood except by hard work, are sometimes unfortunately constrained to give up hope of cure. Such is the imperfect state of our methods of relieving this class.

The relaxing influence of menstruation, leucorrhoea, and menorrhagia is well known. In connexion with procidentia their influence is, no doubt, chiefly exerted on the vaginal walls. The increased firmness of this and of other neighbouring parts may impede or prevent descent. It is therefore desirable to remove leucorrhoea or menorrhagia, and to restore the tone of the vaginal walls by medicines, baths, or by mild local astringent applications.

The weight of the uterus as a whole, or of its different parts, may be increased by various diseases, and the injurious influence of such increase must be apparent to all. The cause of the increase should be carefully investigated and the appropriate treatment applied.

It is well known that increase of weight of the uterus, whether healthy or morbid, is often accompanied by little, if any, descent. The influences which may counteract the inevitable tendency to descent are little understood, and present great difficulties in their investigation. It is probable that what has been called the retentive power of the abdomen is the chief agent; and it would be a great discovery to be able to increase this power at will. There can be little doubt that, in many women, this power is diminished by stays or other means of compressing the abdomen, chiefly at its upper part; and it is easy to have all such injurious compression removed. The expansion of the base of the thorax may increase the retentive power of the abdomen and act beneficially against a procidentia.

For severer cases of procidentia, remedies must be used which are stronger in their effects than those enumerated above. The bull must be taken by the horns. One of the most valuable of these stronger remedies I have fully described in two papers recently published in this Journal. One of these is entitled "The Function of the Perineum in Procidentia Uteri," and is to be found in the number for February 1871. The second, entitled "The Restoration of the Perineum," appeared in the last November number. This operation bars the way against the descending viscera, and is often successful, even when unaided by other means of assisting it. But there are few cases in which the use of such means should be omitted.

I have seen a cure effected by disease without surgical aid. Peritonitis affecting replaced parts has been followed by strong parietal adhesions, powerful enough to maintain the viscera in a high position within the pelvis without extraneous aid.

The T bandage, properly made and applied, pushes on the perineum, pushes it towards or against the symphysis pubis, and tends thus to close up the outlet of the vagina against the descending organs. It is easy to conceive that the efficiency of this pressure will be great in proportion to the length and completeness of the perineum. The T bandage is therefore very valuable when worn after the operation of restoration of the perineum. If the vaginal orifice is large, it is not likely to be of much use, for then the organs slip past it or by the sides of it: it does not check their progress when pressing on the vaginal orifice, as it does when pressing on a restored perineum.

There are considerable difficulties in the way of securing the advantages of the apparatus. It is irksome, or even painful, to wear at first, and until the wearer gets accustomed to it. If it be badly made, or ill fitted, it is simply impossible to wear it, if it is made tight enough to be efficient, on account of the pain it causes. Yet there is no doubt many women wear it, and find comfort from it, when it is a perfect sham, being utterly inefficient except as a source of mental comfort and feeling of security.

The object of this T bandage is to support the perineum. The stress of this support is borne by the horizontal limb of the bandage, which surrounds the pelvis over and above the haunch bones. This horizontal limb must be made to fit the parts like a kid glove on the hand. If it does so, a considerable strain can be put on it without pain resulting from the continuance of it. From the horizontal limb the vertical limb passes from behind, through the fork, to the front. It is tightened by a strap and buckle, and made thus to press on the perineum. At the part which touches the perineum is placed a pad, about an inch thick and about three inches long. This pad is covered with glazed leather, or other non-absorbent material, to prevent soiling. This is the pad which conveys the pressure from the vertical limb or under strap to the perineum.

Nothing has more exercised the ingenuity of surgeons than the making of pessaries for procidentia. That which I have found most useful is that which alone I shall describe. It is of the simplest possible construction, and its mode of action is easily intelligible. The best name describes it at once—a disc and stem pessary. The disc is passed through the vaginal orifice as a button is passed through a button-hole, and after having passed into the vagina, it is pushed up into the pelvis. Its flat or convex upper surface supports the viscera, which have a tendency to descend. Its upper surface is kept in this proper attitude to the superincumbent organs by the stem. Were there no stem the disc might turn so as to present its edge to the descending organs, and be itself pushed out through the os vaginæ in much the same manner as it was introduced. Fortunately it often happens that the disc, kept in proper position by the stem, gets somehow so indented into the vaginal wall, and the two get so consolidated, as to prevent descent, without any further aid. Many women are what is called cured by a properly-adjusted pessary alone. This pessary does not, like a globular pessary, dilate the vagina and keep it permanently dilated, and therefore injured. On the other hand, the vagina has a tendency to contract around it. It must therefore be frequently removed, so that it may not at length become incarcerated. This removal and replacement may be effected occasionally by the surgeon. Many women learn to do it for themselves, and remove the instrument every night on going to bed, and replace it in the morning.

This instrument may be made of boxwood with advantage. The material is light and enduring; but other materials may be used at will. The disc is like a bi-convex lens with blunted edges. Its diameter varies from 1½ to 3 inches. Various sizes are required in varying cases. To the lower surface of the disc is attached the stem, whose lower end is enlarged into a small globe of the size of a boy's marble. This part is so globularly constructed to obviate the evil effects of pressure of a small or sharp end. The length of the stem is about 2½ inches.

I have never seen a replaceable procidentia which could not be cured by one or more of the three means here described.

It appears to me, and it is contrary to opinions which are extensively acted upon, that a pessary should always be avoided if possible. The best pessary is a source of some irritation, often also of discomfort.

Before a pessary is introduced, the procident viscera have to be replaced; and it is advantageous to maintain the replacement by keeping the woman in bed for some time before the pessary is introduced. This allows of diminution of hypertrophy and healing of inflamed or ulcerated parts. Cleansing and soothing vaginal washes are useful during this time.

Replacement is generally easily accomplished, the parts being repelled in the direction opposite to that which they followed in their descent. Sometimes a little temporary difficulty is felt, from the fundus, being turned backwards, hitching or catching on the fourchette. When perimetric adhesions or parametric indurations are extensive, replacement may be for a time impossible, and its ultimate attainment may be reached with difficultly and by slow degrees.

ARTICLE II.—*Cases of Vesico-Vaginal Fistula.* By JOSEPH BELL, M.D., F.R.C.S., Surgeon to the Royal Infirmary, etc.

(*Read before the Medico-Chirurgical Society of Edinburgh, 15th November* 1871.)

CASE 1.—Mrs W., æt. 28, had been delivered by instruments after a labour of thirty hours. Extensive sloughing of bladder ensued as a result of the pressure, leaving a very free communication with the vagina and numerous puckered cicatrices.

In May and June 1868, Dr Matthews Duncan operated twice, with the effect of greatly diminishing the openings, closing one entirely. When he kindly asked me to see her in December 1868, the urine still escaped from two openings—one an oblique sinus about the size of a goosequill, between the os uteri and the orifice of the urethra. The anterior wall of vagina was very short, and consisted almost entirely of hard unyielding cicatricial tissue. Another very small sinus allowed a dribbling from the neighbourhood of the left spine of the ischium. This could not be brought into view at all from the hardness and narrowness of the canal.

In December, I operated on the lower and visible opening by cutting out the whole track of the sinus, making an opening into the bladder about three lines in length, and closed it by two silver stitches passed by the ordinary curved tubular needle with a handle.

On the 10th day I removed the stitches, and the wound seemed quite firm.

24*th*.—Another examination showed that a very small aperture still existed. This I found was one of the holes made by the needle in the dense cicatricial tissue. So, on

26*th*.—I again refreshed the edges of the aperture, and stitched it up by two points of suture, put in by very small curved needles, with groove sunk at each side of the edge. This time the orifice was healed.

This poor woman, however, cannot be considered as a perfect cure, as, though she can contain her urine for nearly an hour when sitting, there is still dribbling from the upper aperture referred to, the orifice of which I have never been able to see. Notwithstanding, I have divided as far as possible the cicatricial bands which limit the vagina. The above is from my note-book, but she again came under my observation in October 1871, and I found on further examination that a great improvement had taken place from the division of the cicatrices. The vagina is much softer and more distensible, and I obtained a good view of the upper and hitherto untouched aperture.

So, on 5th November, I again operated, and succeeded, after considerable difficulty, in exposing and closing the higher aperture with six stitches.

15*th*.—I have not yet removed them, but she is dry at present.

Case 2.—Mrs J., æt. 35, the mother of three children, in her last labour about ten months before admission, in a labour of fourteen hours, in which instruments had been used, had received injuries from pressure, causing great destruction between bladder and vagina. Before I saw her she had undergone five operations by different surgeons. Much of the large aperture which had existed had been closed, but there still remained a deep broad aperture about three-quarters of an inch across, close up to the anterior lip of the os uteri, in the very summit of the anterior cul-de-sac of the vagina. The anterior lip was atrophied and denuded of mucous membrane.

On consultation with Dr Matthews Duncan, we agreed that the only chance of obtaining union was to unite the upper edge of the anterior wall of vagina to the posterior lip of the os uteri, and thus to pocket the uterus into the bladder, trusting that menstruation might still go on inside the bladder.

24*th February*.—This I did with very considerable difficulty (as the introduction of the duck-billed speculum forced up the uterus so much as to be out of reach), by dragging down the posterior lip of the os uteri with tonsil forceps. I pared it with Emmet's scissors, and then more easily pared the other edge of the fistula. The passing of the stitches was very difficult, and would, I believe, have been impossible, had I not prepared a number of steel points of various curves, which are welded on without any projecting shoulder to silver wire, and which I have found so useful that now I never use any other needle for these cases. I passed by these seven stitches deeply and firmly, and thus closed the wound. The operation lasted one hour and a half. Catheter inserted.

25th.—Patient quite dry. Very profuse urination by catheter.

1st March.—To-day we were disappointed, finding some urine come per vaginam.

3d.—Stitches removed. Examination showed that the bulk of the wound was soundly healed, only one central stitch having given way.

Patient had to go home to her family for a time, but returned on 5th June, when I examined her, and found the uterus retroverted, and the os uteri almost concealed in the bladder, the tip of the posterior lip only being visible through a small wound, and enabling the patient to retain her urine when in bed.

12th June.—To-day I operated again, paring the edges of the wound very freely, and brought them together again by four deep stitches.

20th.—Catheter removed. Stitches withdrawn. Patient quite dry.

4th July.—Dismissed *cured.*

Case 3.—Mrs K., æt. 30, had six children, was delivered of the seventh by forceps, after which a fistula, nearly one inch in length, in the anterior wall of vagina, extended from near the cervix forwards.

29th March.—I operated in usual manner. Five stitches.

8th April.—Removed stitches. Wound seemed nearly closed. Not absolutely dry, however.

15th.—Found a very small aperture in lowest portion of fistula.

22d.—Again refreshed the edges of the fistula. Five stitches.

12th May.—Removed stitches. Patient quite dry.

18th.—Dismissed cured.

Case 4.—Mrs H., from Leslie, after a lingering labour in which forceps had been used, but without violence, found that she could not retain her urine.

12th May.—I found a small oblique narrow fistulous opening in the anterior wall, about one inch to right of cervix uteri, and about two and a half inches from urethra.

16th.—Pared and closed fistula as usual with five silver sutures.

17th.—She took a bad epileptic fit, and, 18th, was violently hysterical.

30th.—I left the stitches in fourteen days, but removed them today, and found the fistula soundly healed.

This case was easy and promising from the softness and pliability of the tissues, little contraction from sloughing having taken place.

5th June.—She went home quite well.

Case 5.—Mrs C., æt. 30, after a tedious labour, has a small transverse fistula about two inches above urethral aperture. Vagina soft and mobile.

6th March.—Pared and closed wound with five stitches.

13th—Removed stitches.

22d.—Dismissed quite dry. *Cured.*

I have ventured to bring these few cases before the Society, partly to elicit, if possible, an instructive discussion on the principles which should guide us in the performance of this difficult and important operation, and partly to bring before its notice the little change, which I believe is an improvement, in the needle with which the operation is performed.

To obtain the success which fifty years ago was almost unknown, but which now may be hoped for in five cases out of six, if patient and surgeon have patience enough, the following seem to be the chief indications:—

1. A very thorough refreshing of the whole thickness of the edge of the fistula—not only the mucous membrane of the vagina, but the intervening tissue, and even the mucous membrane of the bladder itself.

2. That as far as possible all tension on the stitches should be avoided, and that for this end bands of cicatrix should be divided, and the bladder kept empty by the constant presence of a well-balanced lead catheter.

3. Metallic sutures should be used in every case where it is possible to apply them.

4. Absolute rest of part and patient,—bowels being kept unmoved and bladder empty for ten days at least, perhaps even for a fortnight.

With regard to the *modus operandi*, I give chloroform in every case; and, as a rule, operate with the patient lying well over on her left side, with the knees drawn up nearly to the chin.

The duck-bill speculum of Marion Sims can nearly always be used, and is of essential service.

Where the edges can be reached by a knife, I prefer it, either a sharp-pointed double-edged needle knife or an ordinary scalpel. I have not found much advantage from Emmet's knife with the ball-and-socket joint. When from cicatrization or depth of parts a knife cannot be used, the scissors curved in various directions, which Emmet describes and uses, are very good; but they are very expensive and not easily made from the difficulty of getting the curved edges to meet correctly. Long catch forceps are very useful to secure that any small fragment of edge be removed that may have been missed by the scissors. This is of vital importance for the success of the operation.

The tubular needles for passing silver wire are ingenious and not difficult to work, but have two very great practical disadvantages:—

1. They cannot be passed through first one edge and then the other, but the wire has in every case to be withdrawn from the needle, and the needle re-threaded. This is troublesome, apt to confuse the threads of silk, and, still worse, if metallic, apt to cause *kinks* in the wire, which are fatal to the success.

2. The tubular needle makes too large a hole. This does not matter so much when the mucous membrane is soft and elastic, but when it is cicatricial tissue which you are boring, the big hole remains like one punched out of leather. In one of the cases alluded to I had to operate again to close a needle-hole, after having closed the original fissure.

For these and other reasons the tubular needles are by many operators rejected, notably by Dr Emmet of New York, already alluded to. He uses small round needles, which carry a loop of fine silk, into which loop, after the needle is passed, a loop of fine virgin-silver wire is introduced, flattened by a strong pair of forceps for the purpose, and then pulled through.

I have, I think, made an improvement on this, so simple as hardly to deserve notice, but still of great practical assistance. I got Mr Gardner, the instrument-maker, to provide for me a series of steel points highly tempered, and curved in various sizes, some not larger than one-third of the circumference of a sixpence, others bearing the same proportion to a shilling, but all welded to the silver wire in such a manner as to project no shoulder and require no threading. I can manage these very easily, either by Sims's needle-forceps or by an ordinary pair of dressing-forceps, and, setting the wire at a right angle to the needle, and curving it round my hand and arm, it is really managed with great ease. The greatest assistance in the passing the needle is afforded by the use of the small hooks I now show, the invention, I believe, of Dr Marion Sims, one unbarbed, the other barbed: the unbarbed one assists in pulling down the mucous membrane after it is refreshed, for the purpose of introducing the needle; while the barbed one is useful in seizing the hard edges of the fistula and bringing them down within reach of the knife or scissors.

Four or six stitches to the inch will be needed, and, as a rule, I would advise that they should be left in for ten days or a fortnight, the bladder being kept empty during that time by the constant presence of a well-balanced sigmoid catheter of lead or block-tin, which can be bent to suit each individual urethra.

I will not venture to take up more of the valuable time of the Society with my remarks, nor shall I enter at all upon the history of this interesting operation, but merely mention that all the elaborate plans of buttons, wire-splints, plates, etc., regarding the priority of invention, of which controversies have been held, are gradually being discarded in favour of the simple and yet effectual means which I have briefly described.

ARTICLE III.—*On Leprosy at Hankow.* By GEORGE SHEARER, M.D.[1]

HANKOW, in the province of Hupeh, 30° 33′ N. lat., 114° 20′ E. long., one of the most important cities of Central China, and the greatest mart of trade, with a population estimated at about 750,000, lies on the northern bank of the Yang-tse-Kiang, at its junction with the river Han. It enjoys a slight but infinitely valuable degree of elevation over the vast surrounding plain from ancient alluvial deposits of a sandy loam, which admits of the rapid percolation and dispersion of moisture, and is therefore a salubrious site for human habitation compared with the stiff clay-bottom lands of the outlying districts. These are subject to annual inundations to the extent of 20 or 30 feet in depth during the autumn months, and from this region, as I purpose to show, the vast majority of the cases both of ague and leprosy are drawn. It is only at rare intervals, and during seasons of unusual flood—as during the years 1868 and 1869—that the city itself is submerged, and even then, from the porous nature of the subsoil, when the water once begins to subside, it does so rapidly and effectually, without the same deleterious consequences to the inhabitants, as in the slowly-draining and retentive soil of the plains. Few if any of the leprosy cases could be proved to have originated in Hankow. And few, if any, were derived from the neighbouring cities of Wuchang (the provincial capital, on the opposite side of the river) or Hanyang, both enjoying a range of elevation which, generally speaking, places them above the level of ordinary floods.

It has been remarked by persons who have resided both in America and China, that the ague of the Western States is a much more prevalent and much more formidable disease than the ague of China. And this may be accounted for to a great extent by the fact that the subsidence of the Mississippi flood takes place during the hottest months of the year, while that of the Yang-tse occurs during the cooler months of autumn.

During my two years' connexion with the native hospital at Hankow, I saw 610 cases of ague, including all the types, and 194 cases classed under the denomination Leprosy.

The leprosy cases were satisfactorily enough classified under the two natural types recognised by Winterbottom, viz., the anæsthetic and the tubercular.

At the end of my first twelvemonth's experience I published a report of some 117 cases, and advanced the novel theory which subsequent experience has amply confirmed, viz., this :—that leprosy, like ague, is an endemic disease, originating in the malaria of low-lying, undrained districts, and that the disease is curable by moving out of the infected districts into higher and drier situations. In one of the cases recorded, the disease had been arrested for a period of thirteen years, during the patient's residence in a dry, hilly region, and returned with great severity on his coming back again to live in the low-lying, marshy district where he originally contracted the disease. The following observations were also recorded:—

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[1] Part of this article appeared, as a sanitary report, in the "North China Customs Gazette" of April and June last.

1*st.* Of the thirty-four lepers all were males, and, I believe, without an exception, at some time or other agricultural labourers, "field hands," who of all classes are most exposed to the exhalations of the wet undrained soil of these provinces.

2*d.* The disease invariably commences with anæsthesia. Along with the loss of sensibility the vigour of the circulation in the affected part becomes impaired, the vital heat is lowered, the parts assume a leaden coldness, their nutrition and usefulness is diminished, wasting and contractions ensue.

3*d.* As the disease advances the sympathetic or nutritive nerves are implicated, and at length the motor.

4*th.* The lesion is therefore clearly traceable to the nervous system, and specially to the sensory strands proceeding from the anterior surfaces of the medulla oblongata and spinal cord. The frequent coexistence of facial paralysis from involvement of the seventh pair of cranial nerves, which springs directly from the parts named, lends weight to this supposition.

5*th.* The malady is essentially chronic in its nature, developing its ravages only after a long procession of years, never affecting the general health, but also, as far as I know, never relaxing its hold upon the victim. It seems, however, to arrest development and retard puberty.

6*th.* The affected parts never perspire. Coincidently with the dropping out of the hair, there is progressive atrophy of the sudoriparous and sebiparous glands of the skin.

7*th.* The simultaneous disappearance of ague and leprosy from Great Britain being coincident with the improvements in drainage of wet lands, marshy lands, etc., points to a common origin in malaria—a condition invariably coexisting with leprosy in China.

8*th.* Tonics and alteratives, in the form of liquor arsenicalis or corrosive sublimate, with generous diet and inunction of stimulating oils and unguents to the affected parts, proved highly useful in many cases. Change of air, the most important factor in the treatment, it was not in our power to command for our patients.

With the added experience of another year, I now submit a detailed statement of all the cases which have come under observation, with the conclusions grounded thereon, numbering in all—of anæsthesia 121, of leprosy 73.

As I think it demonstrable that the former is but the incipient stage of leprosy, I shall first speak of the anæsthesia cases.

There were nine cases of numbness of both hands; two of the right hand only, with imperfect control of the same; two of the thumbs and inner fingers; three of the left hand; one of left arm and left side; three of the arms and hands; six following the distribution of the left ulnar nerve, with pain; one of right hand and forearm for a period of ten years, with partial paralysis of the same for a period of one year; four of hands, arms, and face; one of the face, which is now bronzed, quite destitute of sensibility, and bereft of the eyelashes and eyebrows; one of numbness of hands and feet for a period of thirteen years, with rheumatic pains in the extremities. The hair is dropping out, but there is neither ulceration nor eruption. There is nervous twitching and retraction of the left corner of the mouth and of the left eyelid, the sight of the left eye being impaired. One case of numbness of hands and feet for a period of one year.

Anæsthesia of the trunk following rheumatism, four; of the arms, five; of the feet and legs, nine; with rheumatic pains, six; of the thighs and legs, four; of thighs and hips, seventeen; of the shoulder, two; of face, hands, and feet, five; of big toe, one; of calf, one; of the soles of the feet, one; of the arms, with wasting, two; of half of scalp, two; intensifying numbness with debility (age 63), two; of the arms and legs, with dragging of the mouth and eyelids to one side, one; of the feet, with loss of power, four; "ma-mung" in patches, four; of the side of the foot, with pains in the elbows and soles, one; of the feet, with temporary lameness, one; numbness, pain, and debility in leg, one; numbness of inner aspect of hands, with weakness, six; numbness and paralysis of leg, two.

A boy, aged 18, had numbness of feet and face, with dropping of the hair, and scaly eruption; there were two cases of "ma-mung" or anæsthesia, irregular and scattered, with scaly eruption, which were cured by arsenic; four had numbness in irregular patches; one had intermittent "ma-mung;" one "ma-mung" of thighs, hips, legs, and feet affecting specially the extensor surfaces; one "ma-mung" of right cheek, with ptosis of right upper eyelid and paralysis of right buccinator. Two years before, the last patient had an insensitive spot on the abdomen, which, however, recovered its sensibility.

Contractions of the fingers of left hand, with numbness of a spot on right thigh. Numbness with erythematous blush over the affected skin of foot.

Young man, aged 25, with numb spot (3 inches square) on front of thigh for five years. Numbness of right foot and leg for two months. For twelve months has suffered from recurring attacks of ague.

Man, aged 50, with numbness of both legs and feet for six years. Toes like small puddings, with extensive ulceration and burrowing holes. Health good.

The ages ranged from 18 to 63. The patients were mostly of the male sex. The anæsthesia varied in degree from a preliminary loss of delicacy of perception of tactile impressions up to absolute loss of sensibility in the affected parts. These *never perspired.* In ten cases sensory was combined with motor paralysis, and in two cases with paralysis of the facial nerves.

Where both motory and sensory paralysis are observed in the same subject they are associated, and hardly ever separately affect distantly related parts; from which it may be inferred that both lesions originate in some mischief affecting the roots of the nerves.

Every part of the general integument appears to be liable to the loss of sensibility, the skin of the hands and feet pre-eminently so, and of all nerves, specially the ulnar. The inference is that the operating cause of the anæsthesia is to be found where the nerves issue from the spinal cord and unite their sensory and motor strands together.

It will be seen from the researches of Daniellsen that a morbid deposit is, in point of fact, invariably to be found in the internal organs of leprous subjects, that it specially affects the nervous system, assumes the form of chronic neuritis, is symmetrical, and prefers certain nerves to others—the sensory rather than the motor.

Of the above cases, anæsthesia, pure and simple, was observed in some cases to have existed for a period of five years, but there is no case amongst them where the anæsthesia, having lasted for a period of ten years, was unaccompanied by wasting, paralysis, and ulceration. These, in fact, constitute the connecting link with cases of true leprosy, of which I will now speak.

1. Aged 30, suffering from numbness of inner and ring fingers of left hand and thighs, with dropping out of the eyebrows and hair. Duration one year. A boatman.

2. Numbness for three years of arms, legs, and abdomen.

3. Numbness of fore, middle, and ring fingers, with sharp pains in shoulder and arm.

4. Numbness and ulceration of foot.

5. A fisherman, aged 40, for one year highly anæmic. Hands and feet numb, hair and eyebrows dropping.

6. "Ma-mung," *i.e.*, numbness, of patch on thigh with falling out of the hair, three years.

7. Leper, aged 38, but looks 50 at least, with ulcers, anæsthesia, and dropsical legs.

8. Leper, feet and hands numb, perforating ulcer of sole.

9. Numbness for eight years, sometimes better, sometimes worse, of hands and arms. Eyebrows gone. Cannot wash himself or use his hands. Cannot account for the numbness.

10. Agriculturist, numbness of little and ring fingers of left hand, also of a patch on the inside of right and left thighs, with weakness and pain in the knees.

11. "Ma-mung" of hands, feet, and face, numbness in patches over body, hair dropping out.

12. Field labourer, aged 23. Has observed the eyebrows thickened, itching, and numb for a period of six months, after which the hair began to drop away; the middle finger is numb, and there are numb patches on the right thigh and left ham.

13. Leper, aged 50, disease began with itching, then scurf, numb-

ness, and tubercles. Face broadening, leonizing. The numbness in the hands is exactly limited to the distribution of the ulnar nerve, and there is some degree of paralysis of the muscles of the mouth.

14. A female. Numbness of the hands, with dropping of the eyebrows and hair.

15. Bad case of leprosy, with enlarged glands in the groin.

16. Case of leprosy beginning with tubercular eruption.

17. Countryman, aged 49. "Ma-mung" for nine months of feet and face. Face covered with bronze-coloured itching eruption; eyebrows and hair dropping.

18. Numbness of shoulders and feet (aged 36), along with weakness and pain in the joints. Affected one year with dropping of the hair.

19. Numbness of the hands and feet for a period of five years. Dryness and cracking of the hands and feet, with scurfiness of the surface. Papular eruption of the face, with flattening and broadening of the features. The man is pockpitted.

20. Numbness of the feet, hands, and face, with scurfy eruption.

21. Leprosy-ulcers, healed rapidly after slight salivation with mercury, followed by a course of liquor arsenicalis.

22. Leper, aged 55, with complete insensibility of the hands and feet.

23. Incipient leprosy in a young man, aged 21, of one year's standing; commencing with numbness, it has now reached the stage of entire insensibility of the hands, feet, and face. Face becoming carnified and wrists thickened. Brother affected with ma-mung.

24. Anæsthetic leprosy. The general surface presents a number of bronzed reddish patches, with tuberculated, encrusted spots on arms, legs, and face. The eyes are ferrety.

25. Incipient leprosy in a man aged 35. Numbness of feet and legs with pain; right hand numb, wasted, and without strength.

26. Incipient leprosy in a man aged 50. He is strong and hale, but for five years his face and arms have been numb, and they are now quite destitute of sensibility. The face is bronzed. Eyebrows and eyelashes gone.

27. Leper, with a general eruption of white shining scales.

28. Leper, with swollen, numb face, nine months affected. Knotted, firm, internal jugulars.

29. Leper, aged 40; for six years the face has been numb and leonized; the hands, arms, and legs afterwards numb, with dropping of the eyelashes and eyebrows.

30. Leper, aged 50, with perforating ulcer of the sole and dropsical swelling of the foot. The ulcer healing and the swelling subsiding under arsenic.

31. Another similar to the above.

32. Leper, aged 35; five years a victim. The feet are numb, there is a large fetid ulcer on the sole of the right foot, and slight paralysis of the face, eye, and mouth.

33. Leper, aged 19. Deep perforating ulcer of heel and toe of the right foot, reaching to the bone, and punched-out looking. Foot, instep, and ankle numb; skin of knee ditto; also along the course of the ulnar nerves. The insensibility preceded the ulceration.

34. Leper, aged 39, of three years' standing. Two toes have dropped away, and there are two large fetid ulcers on the sole of the foot, which is numb, whilst the leg itself is wasted and trembles as in trembling palsy. There is numbness also of the right hand. Otherwise in good health.

35. Leper, aged 28, of two years' standing. Eyebrows and eyelashes gone, hair falling out. Ma-mung of hands, arms, and part of the body and face. Eyes ferrety, with arcus senilis. Face tuberculated and bronzed.

36. Agricultural labourer, aged 34, suffering for two years. Has no relatives similarly affected. There is a fetid ulcer of the sole of the left foot, and the interossei muscles and ball of the little finger are much wasted. The numbness began in the hands, and there are benumbed patches all over the trunk, but the face is free and the hair intact.

37. Man, aged 35. Complains of numbness without itching of the general surface of the body and extremities for three years past, and growing worse. Eyebrows and hair dropped. It is not inherited. The neighbourhood he lives in is regularly flooded year by year. There are three other lepers in the village.

38. Field hand, aged 47. Ma-mung of hands, face, and feet for one year, together with debility, following attacks of ague and dysentery. Not inherited. No dropping of the hair as yet. His place annually flooded.

39. Field hand, aged 27. Ma-mung of hands and feet, itching of the scalp and eyebrows, with partial dropping of the hair, and debility. Not inherited. Has had rheumatism, but neither ague nor dysentery. Place annually flooded.

40. Boatman, aged 52. Leprous for three years. A horribly repulsive sight. The man's features seem cast in bronze, with saffron coloured eyes. Face, hands, and feet numb, the cuticle of the latter granulated, and the legs and thighs covered with eczema.

41. Man, aged 42, a leather-dealer. Complaining for six months past of numbness of the hands and feet, with an itching, numb patch round the umbilicus, and another on the face. Reddened tubercles forming on the arms.

42. Young man, aged 24, suffering for six years from anæsthesia of the hands and feet, and for four years from perforating ulcers at corresponding points of the outer borders of both feet, near the root of the little toe. The muscular ball of flesh at the outer border of the right hand is wasted and numb.

43. Leper, aged 27. General anæsthesia, with scurvy, eczematous eruption over the body, and deep circular ulcer of the sole, set as it were in a ring of thickened cuticle. Right hand crippled;

left toes gone. He is a field labourer, and has been afflicted in this way for four years. Breath foul and offensive, with a mercurial fœtor. The numbness began in a spot over the left elbow, along with which the scaly eruption made its appearance.

44. Young man, aged 18, affected with ma-mung for five years. Complete insensibility of the thighs, legs, and feet, as also of the two inner fingers of either hand, supplied by the ulnar nerve. Face numb, skin of legs dry and unperspiring, in scaly plaits. Legs weak, eyebrows and hair beginning to drop. His grandfather had been affected with anæsthesia, but got cured of it. Father, mother, and other relatives quite free from it. Says that there are a number of lepers in his village. Anæsthesia reported as improving under the arsenical treatment.

45. A woman, who also works in the fields, affected with numbness of the left leg and arm, inner fingers of the left hand, and left side of the scalp, which is both numb and painful. She has been affected thus for a year. Hair dropping out. Skin free from rash or ulcer, but dry, rough, and unperspiring in the benumbed parts.

46. Leper, aged 40, a field hand. Complains of numbness of the hands and feet; face numb and fleshy, with falling out of the hair and eyebrows. There is thickening and hardening of the skin of the soles, with linear ulceration scoring them across.

47. Young man, aged 23, for ten months affected with symptoms of leprosy. There is ma-mung of the feet and legs, of the face and inner aspect of the forearms, and little and ring fingers, following the distribution of the ulnar nerve. The face is bronzing, and with the neck becoming full of erythematous tubercles. The skin on the back is becoming marked in a mosaic of white spots on a dark ground, without scale, eruption, or change of texture in the skin, a kind of marbling of the skin in different colours. He ploughs and sows the fields in a wet marshy district.

48. Farm labourer, aged 52, affected for a year with numbness of the feet and legs, hands and arms, face and ears. The insensibility is complete, and there is deep-seated aching in the bones. There is an eruption of broad, thin scales of cuticle on the legs, but no ulcers; skin harsh and unperspiring; no tubercles or eruption. There are nervous twitchings of the face, and mercurial fœtor of the breath.

49. Field labourer, aged forty, for three years affected with ma-mung of the extremities and face. He defines ma-mung as an itching of the skin when he is warm, and a painful condition of the same when cold, with a degree of numbness. The skin of the whole body is affected, but that of the feet and legs is worse, being insensible to pinching. The eyelashes and eyebrows, together with a portion of the "tail," have dropped. There are no ulcers, neither is there any rash, but a dry, harsh state of the cuticle which coheres in large flakes on the leg. In the morning, when he first gets up,

there is pain in the soles of the feet, but after walking about for a while this goes away. A pure case of anæsthetic leprosy.

50. Field labourer, aged 42, a leper, with immense fetid ulcers of the soles of the feet and big toes, the skin being enormously thickened around the edges of the same. Hands totally maimed, and fingers mostly dropped off. Yet in this case the hair and eyebrows have not dropped, and there is no thickening or other alteration of the features. He has been afflicted for fourteen years. Testes atrophied and soft. Ankles and insteps enormously engorged and thickened. There is a large circular patch on the back destitute of sensibility and power to perspire, and covered with thin, flattened scales.

51. Man, aged 27, suffering for four years from symptoms of leprosy. There is carnification, numbness and itching of the features, and dropping of the hair and eyebrows. He seems 40 at least. He has a heavy, oppressed look, and a remarkable hebetude of expression. There is a type other than this, where a leonine expression arises from the spreading equally over the features of the fleshy or carnifying substance, giving at once brawniness and breadth. This man's place is regularly flooded year by year. He slept on the wet ground one day and rose up with a chill. Three months afterwards he observed the eyebrows drop, and then the numbness of the extremities set in.

52. Leper, aged 43, looks like a man of 60, afflicted for the last twelve years with numbness of the hands and feet. Lives at Hwang-p'e, distant 70 li from Hankow. His legs and the soles of his feet are horribly ulcerated; the ulcers are of three years' standing. Eyebrows, eyelashes, and hair of the head fallen off within the last five years. The numbness began in two corresponding circumscribed spots on the knees, which gradually extended to the toes. The testicles have wasted in a very marked manner.

53. Carpenter, aged 58; mahogany-coloured tubercular swellings of the arms and chest for a fortnight past, attended with heat, itching, numbness, and some pain. On the buttocks and left arm the tubercles have coalesced into a general fleshy swelling of a dusky purple colour, and the use of the arm is impaired. This is the first and only case I know of which appears to have originated in Hankow.

54. A sailor, living in a country district 120 li distant from Hankow, subject to annual floods. Afflicted with numbness for five or six years past in the feet and legs, which never perspire, though the arms and body do. There is numbness also in patches of the general surface, the skin in these situations being of a deep vermilion tint, and covered by a thin, dry, scaly eruption. The thickened cuticle has given way in holes on the right sole, and corn-like masses are forming on the other sole. The thumb and two inner fingers of the left hand are numb, while the sensibility

of the little and ring fingers is unimpaired. The accurate manner in which the numbness is marked off is singular. Nose tinged deeply purple, and numb.

55. A man from Keangshi, aged 39. Has had ma-mung of the feet and legs, and of middle fingers of both hands, for a year or more. Face hot and itching, with evidently increased action of the bloodvessels; parts also a little insensitive. Hair and eyebrows dropping out. Face bronzed, heavy and fleshy, and small copper-coloured tubercles forming in the neck. Eyes reddened and congested. There is nervous twitching of the mouth, and he cannot whistle, while the mouth is contorted in the attempt (facial paralysis). He has worked in the fields for fifteen years.

56. A leper, aged 35, a victim for thirteen years. Numbness and total insensibility of the hands, which are lamed and crippled, and the tendons contracted. Face insensitive, lower eyelids everted, and inability to close the eyelids by a space of half an inch (paralysis of seventh pair). Buccinator paralyzed; mouth twisted to one side; raised red blotches on the skin; eyes ferrety and injected.

57. Incipient leprosy, man aged 50. Strong and hale, but for five years hands, arms, and face numb, now quite destitute of feeling; face bronzed, eyebrows and eyelashes gone.

58. Leper, aged 37. Subject to numbness of arms and hands, legs, feet, and face for a year and a half, which parts never perspire. He is partially bald, and the eyebrows are gone. On the affected parts the skin is dry, shrunken, and shrivelled, while that of the face is reddened, bronzed, and thickened. As yet there is no paralysis of face or limb, though he is too weak to follow the plough.

59. Leper, aged 20, with anæsthesia, thickening and ulceration of the skin of the feet, and contraction of the tendons. No eruption; no tubercle.

60. Incipient leprosy of five months' duration.

61. Leper for seven years. There are tubercles on the neck, psoriasis and pink discolorations of the skin, face broadening, and textures thickening and coarse. The eyes have a lurid glare. Eyesight impaired. There is numbness of the hip.

62. Field labourer, affected for five years past with numbness of the hands and feet, legs and shoulders, with general itching of the surface, carnification of the countenance, falling out of the hair, eyebrows, and eyelashes, pearly white circular scaly eruption on the neck, double chain of enlarged glands in the groins, numerous marks of old cicatrices, but no history of syphilis.

63. Leper, boy aged 16; squat, square, and ill developed; testicles undescended, large ulcer on the legs, no eyebrows, bridge of nose sunk, face leonine and brawny, white scaly eruption on the neck. Numbness of the hands and feet, no itching, no tumours or tumefaction in the neck, nor enlarged glands in the groin. Father

a leper. Ulcers healed up under arsenic and astringent dressings, but within three months broke out afresh.

64. Leper, face leonine and brawny, eyelashes gone, eyes ferrety, rupia-like spots on the legs, gouty enlargements of the joints of left hand.

65. Leper. Corneæ undergoing granular degeneration, conjunctivæ and scleroticæ injected.

66. Leper, aged 31; three years a victim. Eyebrows and eyelashes gone. Curious punched-out looking ulcers on the soles, with enormously thickened cuticular edges. Great toe broadened and ulcerated. Face converted into a species of brawn. Left leg numb, and marked with coloured spots—the sites of old ulcers.

67. Leper; five years a victim. Perforating fetid ulcers and insensibility of the soles of the feet. Imperfect action of the lips and eyelids.

68. Leper, aged 30, four years ill, arcus senilis well developed. Feet and toes ulcerated, hands maimed, feet bronzed, general anæsthesia of the parts affected.

69. Leper, with ulcerated hand, and fingers shrivelled, contracted and bent inward on the palm like eagle's claws. Ma-mung of hands and feet, and paralysis of the motor nerves of the face.

70. Leper, a lad aged 25, affected for a period of seven years. Hands, feet, and face numb. Tissues thickened and bronzed, little finger of right hand dropped off, also distal phalanx of ring finger of left hand. The fingers taper and thin off at the tips, presenting in this respect a marked contrast to the clubbed finger-tips of phthisical patients. There is undoubtedly atrophy of the bulb and other textures of the fingers. Complains of numbness or imperfect wooden feeling in all the affected parts, which are also subject to itching sensations. Joints of both hands scarred (from burns), and rigidly flexed. Hair of eyebrows dropped; imperfect closure of left eye, and dragging of the mouth to right side. Scrotum, like the face, numb. Absence of hair from pubes. Testicles sound. No trace of venereal disease. Two ulcers, one in either palm, produced by pressure of the plough-handles on the insensible textures.

71. Leper; four years a victim. Deep dormant fetid ulcers in the sole of right foot, with thick coriaceous edges, thickening of the tissues on the dorsum of the foot, with bronzing, scaly scurf, and numbness. Left hand crippled and withered, as if from palsy. Every joint stiff as if anchylosed, and marked with white cicatrices indicating old ulceration. Seventeen years ago the hand became ulcerated and crippled from spontaneous ulceration, accompanied by anæsthesia, and it has never since recovered its normal condition. Otherwise he continued well till four years ago, when numbness was felt at the tip of the great toe, and a blister formed which broke and deepened into an ulcer. In the meantime he had removed from a more elevated and drier locality to Whampi, a low

level plain to the north of Hankow, where he originally resided, and had become first affected with leprous symptoms. The numbness and thickening of tissue extended at length from the toe to the knee. This case shows—1*st*, That leprosy begins with anæsthesia, and is followed by defective nutrition and loss of power in the parts concerned. 2*d*, Its progress is sometimes spontaneously arrested, as in this case, for thirteen years. 3*d*, The arrest appears to have depended upon his removal from a marshy locality to a higher and drier neighbourhood.

72. Incipient leprosy in a man aged 27. Numbness and eruption on the legs and arms for a period of two years. The eruption resembles psoriasis guttata—rounded spots covered with an aggregation of white scales, and revealing, when removed, a silvery basis. When cured, a dark discoloured spot remains. Eyelashes and eyebrows gone. Great loss of power in the arms and hands, and the parts affected with numbness never perspire. No trace of syphilis. The eruption is disposed in elegant curved lines, and concentric circles of geometrical exactness.

73. Leprosy, an agricultural labourer, 31 years old. When 10 years old had a sort of white scaly eruption, which left rupia-like marks on the hips, the affected parts being numb. When 14 years old the right hand became crippled; when 21, the left. The flexor tendons in the forearms are tense, and the muscular substance wasted up to the middle of the arm, where the muscular volume is sharply resumed. Palmar fasciæ tense. Finger-bulbs atrophied and flexed rigidly on the palm. Patches of leprous mahogany-coloured redness with minute chaffy scales on the surfaces of either forearm. Legs and feet, hands and arms numb. Face numb in patches. He cannot completely shut the left eye. Sensation diminished although not quite lost in the parts affected. General health good. Ten or twelve cases of leprosy said to exist in the same village.

74. Young man, aged 31, a leper. Painful sensations in the joints of the hands and feet, with partial anæsthesia of the hands and arms, feet and legs. Anæsthesia complete in the little and ring fingers of either hand, following the distribution of the ulnar nerve. From elbows to finger-tips and from knees to toes—that is, the whole of the parts affected—are dry, and scurfy and non-perspiring. The skin of the face is beginning to swell and redden in patches without numbness, but with much itching, and the hair of the eyebrows and head is beginning to drop. Has never had syphilis. Does mason's work, but is also occupied at the proper seasons in ploughing and sowing. No eruption, but the anæsthesia and loss of hair are proceeding rapidly, he being only one year affected. There is sluggishness in the opening and closing of the eyes and in the action of the muscles of the mouth, with nervous tremors of the muscles themselves when called into action.

Observation A. The whole of the foregoing cases were seen within a period of twelve months at Hankow. During a seven months' residence in Kiukiang, which enjoys a hilly situation and is seldom subject to inundations, not a single case has been seen.

B. Of the whole number, only one properly belongs to Hankow, and appears to have originated there, yet Hankow is notoriously subject to inundations. The immunity of the inhabitants of Hankow at once from ague and leprosy probably depends upon the sandy nature of the subsoil on which the city is built, which allows of a ready drainage and quick drying after floods and rainfalls. On the other hand, the stiff, tenacious clay of the outlying and surrounding districts retains the water on the surface in impermeable ponds and pools, in which both animal and vegetable life abounds, until the solar-evaporation has converted the whole into a semi-fluid, festering mass of decay, the very hotbed of malaria. My experience at the Hospital in Hankow leads me to say that the ague cases, equally with the leprosy cases, were imported, and that to the best of my knowledge they were principally drawn from necessarily malarious localities, *i.e.*, where there is no natural drainage.

C. Of the anæsthetic cases not more than ten or twelve were women, and of the lepers only two. The vast majority of those afflicted followed one and the same occupation, viz., that of agricultural labour, in which they are necessarily exposed to the exhalations of the wet undrained soil in a degree far beyond any other class of residents in the same locality.

D. The whole of the foregoing cases may be conveniently arranged into three groups—

1. Cases of simple anæsthesia, ma-mung or impairment of nervous sensibility in a part or parts of the body.

2. Cases of anæsthetic leprosy, where the loss of sensibility is attended by eruption (pityriasis, psoriasis) or wasting and shrivelling of the skin and sweat-glands (hence the unperspirable condition of the affected parts), and ultimately by decadence of the hair, eyebrows, and eyelashes. Along with the external numbness there may or may not be internal and accompanying pain in the limbs; and when ulceration takes place, from improper contact with bodies, through lack of the warning protection afforded by the perfect sense of touch, the ulcers are comparatively easily healed. Contractions and atrophy of parts ensue. Facial paralysis is a common accompaniment both of this and the next form.

3. Cases of tubercular leprosy, where, in addition to the above symptoms, there is a local morbid deposit in the affected parts. When it occupies the subcutaneous tissues of the face and cheeks, the countenance assumes leonine breadth, a satyric stare, or seems as if cast in bronze. When under the eyebrows, the heavy, beetling brows give an expression of hebetude and oppression to the face as if the subjects of it were labouring, as in sad truth they do,

under some horrible incubus which they are powerless to shake off. Carnification or tuberculization of the lower extremities is apt to proceed to ulceration of a very peculiar description, burrowing deeply, with immense thickening of the adjoining corium, in some instances attaining a thickness of half an inch or so. Sometimes the eruption appears in detached copper-coloured tubercles, sometimes as a bronze or mahogany-coloured rash, whence the native name of "ma-mung," or spotted leprosy. Necrosis of phalanges and destruction of joints and limbs are the sequelæ of this form of the disease, and amongst the accompaniments may be mentioned swelling and pink injection of the conjunctivæ, impairment or loss of the sense of smell, hoarse, nasal, or croaking alteration of the voice, ulceration of the mucous follicles of the throat, with exceeding foulness of the breath, resembling the mercurial fœtor. The freedom from pain and suffering is no less remarkable than the absence of any derangement of the general health. In all, however, there is a marked deficiency of vital energy.

E. Since the publication of Daniellssen's researches on leprosy in Norway and Sweden, and his discovery of a peculiar morbid deposit in the internal organs, and specially in the nerves of persons who had died of leprosy,[1] we have been furnished with a clue to the

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[1] The lesions traceable to leprosic deposit Daniellssen found in nearly every organ in the body and especially in the nerves (the kidneys alone excepted). This chronic neuritis is symmetrical, and prefers certain nerves to others, and the sensory to the motor.

It is well to compare these statements, made on Daniellssen's authority, with the recorded results of the very few post-mortem examinations of leprous patients made by private practitioners. Thus, at page 60 of the College of Physicians' Report, Mr Macnamara of Mozufferpore (Bengal) says—"I have made five post-mortems upon the bodies of leprous patients, my attention being more particularly directed to the nervous system, and neither in the nerves themselves nor in the brain and spinal cord have I been able to detect any lesion, either with the naked eye or by the aid of the microscope." Dr Mongeri of Crete, Dr Davy of Ceylon, and Mr Hutchinson of Victoria, have described the appearances after death, but seem to have been struck only by the excessive development of "tubercles" in the skin and serous and mucous membranes. In all three cases the larynx had specially suffered. Dr Carter of Bombay (R. C. P. Report, page 62) noted the results of sixteen post-mortems after death from leprosy. "In five cases where death was attributable to chronic dysentery, kidney disease was certainly present in two, and in a third fibrinous deposit was found. . . . Enlargement and diminished opacity are the fundamental changes which the nerves exhibit. The general cellular investment, the ordinary seat of neuromatous swellings, inflammatory and other formations, is here but little altered: the amount of enlargement varies from just above the normal size (at the seat of disease, above or below it the nerve may be smaller than natural) to more than twice that; the colour may be gray, reddish gray, reddish brown, or, very rarely, a dead opaque white; the consistence of all degrees, from almost flabby to semi-cartilaginous, but generally firmer than natural; marked vascularity is uncommon; adhesions have been found, but only under exceptional circumstances. The cutaneous nerves are altered in a similar manner, but are sometimes less rounded and firm. These changes do not occur indiscriminately in the course of the nerves, but make their appearance at certain selected spots—for the compound trunks connexion of the different forms. The cases of pure anæsthesia are traceable to leprosic deposit on or near the roots of the sensory nerves, and the tuberculous form of local deposits in the subcutaneous cellular tissue. This circumstance will help to explain both the peculiar character of the ulceration and its resistance to treatment.

F. While we are thus able to group all the forms of this disease into one category, and to say that they seem all to depend upon one condition, viz., leprosic deposit variously situated, the question arises whence is this diathesis or cachectic condition of the body induced. To this I think my experience allows of one answer only. A morbid condition of the blood is determined by breathing the impure air of certain malarious districts, and leprosic deposit with all its consequences is the result. In this respect the leprous diathesis is comparable with that of phthisis, which is remarkable for choosing two systems, the pulmonary and glandular, as the seat of deposit, rather than with the gouty and aguish diatheses, where the virus accumulating for a period at length explodes, as it were, in a gouty or aguish fit allowing of a temporary or it may be complete return to health. And just as phthisis and gout are unknown in the same individual, so leprosy and ague rarely, if ever, affect the same person. Leprosy is therefore truly an endemic disease, and in all probability originates in malaria.

G. There is no proof that it is induced by diet—fish diet or other food. There is not the least proof of any connexion between leprosy and syphilis.

H. It is transmissible hereditarily, though the fact has been rarely observed, and one is liable to the fallacy of confounding the effect of the endemic influences in originating the malady with its conjectural inheritance.

I. Its contagiousness is extremely problematical: in this part of China it is positively regarded as *non-contagious*, and lepers may at any time be seen in the streets and shops, freely mixing with the people, as small tradesmen, as water-bearers, as beggars squatting by the wayside. No lazar-house exists in these parts. The better-off classes in China, as in Norway, have the most perfect confidence in their own immunity from the disease even where lepers abound.[1]

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where they are most superficially placed, for the cutaneous nerves immediately after they have perforated the deep fascia. As regards the former, the nerve-trunk above the *locus morbi* may be unchanged; below it is usually atrophied, but occasionally almost normal in appearance and structure: the apparent extent of disease may be limited to two or three inches, but it is often considerably more; in both sets of nerves the terminal branches will be found atrophied and pearly in aspect, being, in well-marked cases, evidently incapable of performing their functions."

[1] This is strongly insisted on by Dr Bowerbank of Jamaica (Royal College of Physicians' Report of Leprosy, 1867; page 13.) He says:—"I do not believe it is contagious in any of its stages, nor do I believe it can be transmitted

J. The disease is said to be on the increase in Jamaica during the last twelve or fifteen years, because of the retrogression towards barbarism of the bulk of the population. Imperfect tillage, draining, and culture of the land furnish the essential conditions for the development of the marsh poison. There is historical evidence that leprosy once prevailed extensively in districts and countries from which it, as well as ague, has now disappeared; and I believe it to be capable of demonstration that the two disappeared simultaneously through the introduction of the modern system of drainage.

K. No. 71 is not the only case which has come under my observation of the arrest of the disease through change of residence. Of some others of a like nature the notes have been lost. Happily, however, the defect in the chain of evidence is supplied by a writer in a recent number of the *British and Foreign Medico-Chirurgical Review*, who says that the Norwegian physicians recognise the endemic nature of the disease, and the fact that immigrants take it or lose it by removing to or from infected districts. Strangers may contract the disease *de novo*. It is further asserted that Norwegian lepers emigrating to America get well of the disease, and no new cases occur amongst them.

L. Dr Beauperthuy of Trinidad has established a very successful method of treating leprosy in that island, of which the following are the leading principles:—A nourishing diet, with fresh meat and light wine twice a day; salt fish, beef, and pork, being prohibited entirely. Corrosive sublimate in doses of one-fifteenth of a grain is administered twice a day, and inunction of the whole body with oil of cashew or cocoanut is practised night and morning. The most important part of the system, however, consists in the removal of the patients from the neighbourhood of marshes. The results are satisfactory; the tubercles are entirely removed; the sensibility and power of movement in the paralyzed limbs are restored, and the general health is improved.

M. Until, therefore, the appliances of modern skill in the interest alike of agriculture and the public health are called into requisition, of which there is certainly but a very distant prospect at present, we cannot attack the evil at its source, or hope to do more than mitigate suffering and effect the cure of a certain number of cases. But this should by all means be attempted. And there surely cannot be much difficulty in finding amongst the upper ports of the river a suitable locality for the establishment of a sanatorium or lazaretto.

by sexual intercourse. I have known a man to live with his wife for sixteen or eighteen years after he had elephantiasis tuberculata, and have children by her during the time; he died in an advanced stage of the disease, but she never suffered. Two of the sons, however, were attacked. Again, I have known a man live for years with his wife, who was leprous, without his suffering."

ARTICLE IV.—*On Menstrual Coagula.* By JOHN HADDON, M.A., M.D., Eccles.

ABORTION is a very convenient name, and under it are classed many cases which have no claim to such a designation.

It is not so generally known as it ought to be, that blood may be retained in the uterus for one, two, or more months, without any untoward symptoms, until hæmorrhage begins, and the clot is expelled with pain and flooding.

Such cases as these may have, no doubt, the history, as well as some of the signs and symptoms, of abortion; and even the product may be mistaken for an aborted ovum—more especially if any of the decidual uterine membrane, which is seen in membranous dysmenorrhœa, be present.

I had not long been in general practice before meeting with cases which I supposed to be abortions, where, nevertheless, I could find no trace of any part of the ovum. There is no great harm in telling a woman in married life that she has aborted, where the symptoms of abortion were present, even though no trace of the ovum can be discovered. When it happens, however, as it did to me, that you meet with such a case in an unmarried young lady, you must pause and consider the case very minutely before even hinting at the possible occurrence of conception. I shall relate the case which led me to suspect that abortion may be in many cases simulated by an affection having its origin in some peculiar state of the menstrual function.

A. H., aged 28 years, and unmarried, states that, when sixteen years old, she had a fever, during which menstruation began. It continued normal till about the age of twenty, when, after sitting on damp grass, she had an affection of the uterus, which confined her to bed for some weeks. Since that time menstruation, though regular, has been attended with considerable pain, and followed by more or less leucorrhœa. She has also been subject to hysterical attacks in the form of convulsions. From April 1870, menstruation was regular every month, lasting about three days, and followed by copious leucorrhœa, which continued during the interval. She also complained of pain in the back and in the left side, was unable to walk much, and very subject to hysterical convulsions. She improved under general and simple local treatment. In June she had no hysteria, very little leucorrhœa, no pain, and was able to walk long distances.

On 12th September 1870, I was called in the night to see her. I found that, since June, she had been quite regular, with very little leucorrhœa, and had felt stronger than usual. On 1st September, which was her monthly period, menstruation did not occur. She did not feel ill in any way until 12th September. On that day she had pain in the abdomen, and was altogether out of sorts. During the night she became hysterical, and lay in a half-unconscious state. Her pulse was normal. There was no uterine discharge; but she complained of pain in the left inguinal region, which was increased on pressure. Over the tender part there was some fulness, and slight dulness on percussion. Poultices were applied, and she was confined to bed. The pain gradually subsided, but she was advised to stay in bed till the next period had passed. On 30th September she began to menstruate. On 1st October it became very profuse. I found her flooding, and was shown several clots the size of walnuts, which had been discharged. The face was pale and the lips blanched: the pulse was quick and weak. On vaginal examination, the uterus was found low down in the vagina, and quite movable; the cervical walls were thickened, the body larger than natural, and the os just open enough to admit the tip of the forefinger. Ergot was administered, and other means used to stay the flooding, which soon abated. The sanguineous discharge continued. She had occasional sharp pains in the back, and some difficulty in micturition. On the twelfth day from the beginning of the discharge, when it had almost ceased, a mass was passed which in shape resembled a cast of the interior of an enlarged uterus. On vaginal examination at this time, the uterus was higher up and larger than before—as large, indeed, as it would be in a two months' pregnancy. The os was open enough to admit the forefinger. After the appearance of the mass, to be described immediately, the discharge entirely ceased. She menstruated again in the end of October, and has been well since.

Description of the mass.—It was slightly pear-shaped, and as large as a small hen's egg. Its consistence was firm, and from its narrower end hung long shreds of fibrin. On section through the middle, a cyst was found in the broader part. This cyst was an inch in length, half an inch in breadth, contained clear serum, and was lined by a smooth shining membrane. Around the cyst the substance was of a dark red, almost a black, colour; while the outer part was of a firmer consistence, and paler in colour. No organized structure could be detected by the microscope.

Such is an account of the facts of the case. Had it occurred in a married person I should have thought it was an abortion, but as there was not the least suspicion of pregnancy, I was induced to give the case more consideration. There could be no doubt as to the mass expelled being an old clot of blood. What its age may have been is a matter of opinion; and some may doubt whether it was uterine. I am inclined to believe that it was formed in the uterus on 12th September, because when menstruation began the uterus was larger than natural, and continued to enlarge until the mass was expelled.

In April 1871 I met with the following case:—

Case 2.—Mrs C——, aged 28 years, was married five years ago, and had a child in due course. She conceived again and was delivered of a healthy child at the full time. Eleven months after the birth of this second child, having been regular for five months, she did not menstruate for seven weeks. She then began to be poorly, and on the eighth day the doctor removed a mass from her womb.

The doctor called it a false conception.

During the seven weeks she did not menstruate she had none of the feelings she was accustomed to have at the beginning of pregnancy. In fact, she did not think that she was pregnant.

The next child was born a month past the full time in a state of decomposition.

Her last child, *i.e.*, her fourth, is thirteen months old, and healthy.

On 7th April 1871, she ceased to menstruate, having been ill eight or nine days. Her usual time is five days, and this month it not only lasted longer, but she had also a great deal of pain, which she was not accustomed to have. On 6th June, having seen nothing in the interval, she observed a pale discharge begin. On the 7th, it became sanguineous, increased, and went on till the 11th, when she also had something like labour pains. On vaginal examination the uterus was found larger than usual, low down in the vagina, the os the size of a shilling, and clots blocking it up. Ergot was given.

12*th June.*—The discharge continues, but is not so profuse. She has pains occasionally.

13*th.*—The os uteri is more open, and the discharge continues.

14*th.* — On examining to-night I found something filling up the widely dilated os. On removal it proved to be a pear-shaped mass the size of a small hen's egg, of firm consistence. On section a cyst was found in the middle, with a smooth lining membrane, and containing nothing except a little clear serum. The part around the cyst was darker than the circumference, but the whole exactly resembled the section of an old clot of blood. The discharge soon ceased after the mass was removed, and she was soon well. During the eight weeks she did not menstruate she had no feelings of pregnancy, and could not believe that she was pregnant.

In this case not a trace of any product of conception could be found. It was exactly similar to the clot met with in Case 1. There can be no doubt that it was a clot of blood. I took it from the uterus. Its age is a matter of opinion.

Thus, then, I concluded that clots may form in the uterus independent of impregnation, remain there for some time, and ultimately be expelled with all the symptoms of an abortion.

In looking through the literature of the diseases of women, I came upon Dr Granville's graphic illustrations of abortion and the diseases of menstruation, published in 1834. In this work there are plates of what he calls polymenorrhœic stratifications, which exactly resemble the two clots I have described. He says polymenorrhœa, by which he means profuse menstruation, may produce stratifications in the uterus.

Dr Graily Hewitt, in his book on Diseases of Women, says, "Coagula may form within the uterine cavity in connexion with uterine hæmorrhage of all kinds, after labour, in consequence of the presence of polypi, cancer of the uterus, profuse menstruation, etc.

"Coagula, not recent, may present a tolerably firm, dense, grayish, fibrinous-looking surface. The want of organization in the mass, and the presence of blood-corpuscles, would assist in the diagnosis of the nature of the substance. The centre of the mass, moreover, generally exhibits a clot of a darker colour comparatively unaltered, which was the original nucleus of the formation."

Again he says, "In some rare cases coagula of some size have been expelled from the uterus unconnected with the previous occurrence of conception."

In the Pathological Society's Transactions, vol. xv. page 169, a case in point is recorded.

The information derived from these two authors shows that it was ignorance on my part which led me to suppose that I had observed a class of cases not before described. Nevertheless, though I cannot strictly claim originality in this paper, I am convinced, from experience in connexion with a medical society of which I am a member, that the existence of such cases is not so well known amongst medical practitioners as it ought to be. Ignorance of the fact that such cases do occur may throw suspicion upon those who are perfectly void of offence, and blast the reputation of many a virgin.

Nothing can be more annoying than to harbour a suspicion which you dare not mention; and if this communication should relieve any one from such a position, it will not have been made in vain.

ARTICLE V.—*Clinical Lectures on Diseases of the Heart.* By GEORGE W. BALFOUR, M.D., F.R.C.P.E., Physician to the Royal Infirmary.

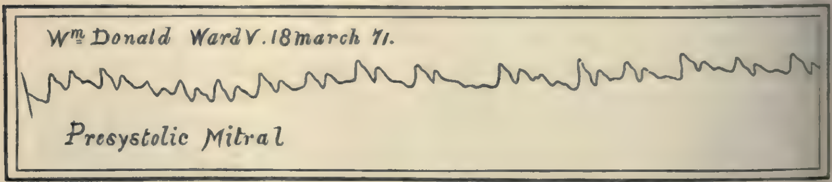
II.—*On the Murmurs and other Physical Signs Distinctive of Mitral Stenosis—continued.*

GENTLEMEN,—You have learned, I hope, from the previous lecture, that the essence of the cardiac affection in mitral stenosis is obstruction to the onward current of the blood at the mitral valve; and we deduce this from the fact that the only murmurs specially distinctive of this form of valvular lesion are those which, from the position at which they are best heard, are known to originate at the mitral valve, and which, from the time during which they are heard, are recognised as occurring occasionally during the ventricular diastole, but specially during that part of the pause occupied by the auricular systole. Now, these murmurs, as I have already described them, are perfectly distinctive of mitral stenosis, and when once the existence of one or other of them has been recognised, disease and deformity of that valve may be predicted, with a perfect certainty that it will be found after death. Unfortunately these murmurs are not always present, and sometimes, though occasionally audible, they are not always to be heard at the period of examination, that very time when it is of the greatest importance that a cardiac lesion should be recognised if present. In most cases the diastolic portion of the murmur is entirely wanting, and in many even the auriculo-systolic portion seems, if we can trust a hospital history of two or three years at least, never to have been audibly present at all; but, besides this, each portion of the murmur may vanish temporarily for a longer or shorter period, and this sometimes in a most remarkable and unaccountable manner. Further, as a necessary result of the condition of the valve in the most usual form of mitral stenosis (the diaphragmatic valve) we have regurgitation of the blood backwards into the auricle. In perhaps the larger proportion of such cases this regurgitation is unaccompanied by murmur; in a smaller proportion we have both the auriculo-systolic and the ventriculo-systolic murmurs constantly present; in a much smaller proportion we have these murmurs presenting themselves in an irregular fashion, both murmurs being present for one or two beats, the auriculo-systolic or the ventriculo-systolic, chiefly the latter, recurring alone for an irregular number of intervening beats; while in a certain number of cases, the exact proportion of which is as yet unknown, we have the ventriculo-systolic murmur alone and constantly persisting.

Such, then, are the variously complicated forms of murmur which may be heard in cases of mitral stenosis. It would be easy to narrate to you cases illustrative of each variety, but it is quite unnecessary, and would only oppress your memories with unnecessary details. So far as murmurs are concerned, those only are distinctive of mitral stenosis which have been already described, the essential part of them being the presystolic murmur; whenever that is recognised as persistent or can even be picked out as occasionally recurring amid a complication of other murmurs, the case is clear and wants no further proof. When, however, no presystolic murmur, or no murmur at all, can be detected, we are forced to unravel the case by a careful investigation of the various subsidiary phenomena evolved during the cardiac action, as well as of the relative condition of the different cardiac cavities, and the mode of propagation of any murmur which may be present. In this way we shall very frequently be enabled to detect the stenotic condition of the mitral valve even where no murmur at all is present, or where the only murmur audible is one of regurgitation. And this branch of the inquiry is of all the greater importance that it is on the data obtained from it that our prognosis must in every case be founded; the mere diagnosis of mitral stenosis, so readily made in some cases, affording but one, and that in many respects the least important, element in such an inquiry.

Among the most remarkable of these subsidiary phenomena we must reckon irregularity of rhythm, which, always present, I believe, in a greater or less degree, becomes so marked in some cases as to constitute a diagnostic phenomenon of considerable importance. The cause of this great irregularity is not very evident; it does not depend upon dilatation of the left ventricle, which in pure mitral constriction is always rare and never excessive; it is often just as little marked in cases of great debility with dilatation of the right ventricle, as when we have the left ventricle, hypertrophied from secondary causes, acting well to the last, and the right ventricle comparatively unaffected. On the other hand, general debility seems to have some effect in developing it, and it is always lessened by means directed towards improving the general health and cardiac power, but it is chiefly the coexistence of pyrexia which produces its most striking development, and that quite independent of the amount of stenosis present; and it occurs in other forms of cardiac disease under similar circumstances, though never in so marked a degree; its true cause, therefore, would seem to be some lesion of innervation. Of course, in mitral stenosis the elements of irregularity, as I have already described them in connexion with the reduplication of the second sound, are so persistently present that it is no wonder that they should become preeminently manifest on the occurrence of any disturbing cause. The following diagram (fig. 1) graphically represents this extreme irregularity in a sufficiently marked manner.

Fig. 1.



CASE 6.—The patient William Donald, aged 37, admitted into Ward V. on 10th March 1871, was a labourer recently working in a gaswork where he was much exposed to sudden alternations of heat and cold. He had always enjoyed good health till four weeks ago, when he caught a severe cold; since then he had been fever-

ish and ill, with gradually-increasing debility, some cough, and bloody expectoration. On admission he looked somewhat exhausted, his breathing was hurried, his pulse 120 and extremely irregular. On percussion the cardiac dulness was found to be normal, the apex beat being in the usual position. On auscultation over the mitral area, the first sound was found to be of slightly thumping character, impure, but unaccompanied by any bruit; no thrill was perceptible over the apex beat. Between the second and third ribs on the left side close to the sternum, the second sound of the pulmonary artery was heard greatly accentuated. Between the second and third ribs on the right side close to the sternum, the aortic second sound was found to be weakened. At the base generally, but most distinctly about mid sternum on a level with the fourth rib, marked reduplication of the second sound was to be heard. On percussing the lungs, over the left lung anteriorly, the upper portion was found to be natural, and the lower lobe somewhat dull; posteriorly there was a small dull patch about the centre of the scapular space, from the lower border of the scapular space the lung was dull. On the right side posteriorly there was dulness at the lower border of the scapular space, otherwise percussion over the right lung was normal; over the dull portions respiration was more or less obscured; over the other parts vesicular mingled with occasional coarse crepitating rattles. The expectoration was catarrhal, largely mixed with pure blood.

The diagnosis in this case was bronchial catarrh, occurring in a person affected with mitral stenosis, and culminating in pulmonary apoplexy.

The history of an ordinary febrile attack, accompanied by cough, catarrhal expectoration, and occasional coarse crepitation over the chest, persisting four weeks after seizure, sufficiently confirmed the first part of this diagnosis. The copious expectoration of blood, coupled with the existence of dull patches, over which the respiration was obscured, also confirmed the latter part of it.[1] While I based the coexistence of mitral stenosis upon—1*st*, the slightly thumping character of the impure first sound; 2*d*, the extreme irregularity of the pulse, which is so marked in no other form of cardiac disease that I am acquainted with; 3*d*, the reduplication of the second sound, which, though it is found under other circumstances, is never so persistent as in mitral stenosis; and, 4*th*, the weakened character of the aortic, and the strongly accentuated character of the pulmonary second sound. The first of these phenomena duly recognised by a practised ear is, I believe, quite pathognomonic of mitral stenosis, and is almost invariably associated with more or less irregularity of the pulse, though that is not always so extreme as it was in the present case; while the persistence of the third phenomenon described aided greatly, when coupled with the two former, in confirming the diagnosis, which was further strengthened by the subsidiary, and, from a diagnostic point of view, comparatively unimportant phenomena of pulmonary accentuation and hæmoptysis.

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[1] The occlusion of the bronchi passing through the hæmorrhagic masses preventing the development of bronchial breathing in such cases, thus in so far confirming Skoda's theory of the mode of origin of this phenomenon.

After admission, the patient gradually fell into a state of low muttering delirium, from which he was roused by the moderate exhibition of stimulants and the free use of digitalis. For a couple of days subsequently he seemed to rally, and faint hopes of ultimate recovery were beginning to be entertained, when symptoms of subacute peritonitis set in, and in two days afterwards he died, on the 20th March, ten days after admission, the cardiac symptoms remaining unaltered to the close. At the dissection, the small intestines were found matted together by recent lymph, they were congested and friable, and the omentum was adherent to their surface, three ounces of bloody serum being found in the recto-vesical pouch, etc. The heart weighed 17½ ounces; the right auricle was distended, the left auricle flaccid; both ventricles distended with black clots; the right ventricle was somewhat dilated, its auriculo-ventricular opening admitted seven fingers; the left ventricle was somewhat hypertrophied, its cavity not dilated; the aortic and pulmonary valves were competent; a small vegetation was attached to the corpus aurantii of the posterior cusp of the aortic valve. On laying open the left auricle several vegetations were seen encroaching on the auriculo-ventricular opening, one of them quite cartilaginous but movable, the other softer; the mitral orifice admitted two fingers easily, its aortic cusp was shortened and thickened, especially at its free margin. Each pleural sac contained about a pint of fluid. On the right side there were many adhesions, on the left only a few at the apex. The upper lobe of the left lung contained two dark-coloured solid hæmorrhagic masses just beneath the pleura, one two inches and a half from the apex on the posterior aspect of the lung, the other two inches and a half from the interlobular fissure on its anterior aspect; while its inferior lobe contained four similar masses, all just in contact with the pleura, two as large as an orange, the other two the size of a walnut; the largest was in the interlobular fissure, and extended down to the base, the second largest was in the posterior aspect of the lung. The apex of the lower lobe of the right lung contained four hæmorrhagic masses.

The post-mortem appearances, which are extracted from the pathological records of the Royal Infirmary, thus completely confirmed the diagnosis.

In the following very similar case the diagnosis was confirmed, fortunately for the patient not by any pathological research, but by the subsequent development of those bruits which are recognised as pathognomonic of the condition diagnosed.

Case 7.—A. M., aged 31, admitted into Ward V. 23d March 1871. This patient had not previously suffered from rheumatism, nor from any serious illness, and had been always able for his work up to the commencement of his present attack, which dated only five days back. He had then been seized with shivering and slight febrile symptoms, accompanied almost from the first with hæmoptysis. He was somewhat breathless, with hot skin, some cough, copious bloody expectoration, pulse 120, extremely irregular, its sphygmographic tracing precisely resembling that of the former case. On examination his heart was found normal in size, the apex beating between the fifth and sixth ribs, slightly within the nipple line. The heart's action was extremely irregular, and on placing the hand over the apex beat, a thrill running up to the apex beat was occasionally, but not always, perceptible. On auscultating over the mitral area, the first sound was found to be somewhat impure and slightly thumping in character, but no bruit was audible. The pulmonary second sound was accentuated, the aortic somewhat weakened, the two sounds not being simultaneous, but presenting the phenomenon of a reduplicated second sound, most distinctly audible about mid-sternum, opposite the end of the fourth rib. The auscultation and percussion over both lungs was normal, except at the back, posteriorly in the infra-scapular regions, where over both lungs some dulness existed, and the vesicular murmur was much weakened, almost extinct. The diagnosis in this case was slight febricula, complicated with mitral stenosis and pulmonary apoplexy. He was treated with tincture of digitalis and squill, ten minims of each in water four times a day. Under this treatment the hæmoptysis gradually lessened, the pulse became somewhat more regular, and fell to 90, and after about a fortnight's treatment an ordinary presystolic murmur was heard in the mitral area, and a diastolic murmur became audible at the end of the fourth left rib, just where it joined the sternum, the reduplication of the second sound continuing to the last. He was sent to the Convalescent Hospital, and at the end of three weeks again readmitted for a slight exacerbation of his cardiac symptoms, but without hæmoptysis. The murmurs continued as just described, till he was discharged relieved, and declaring himself fit for work.

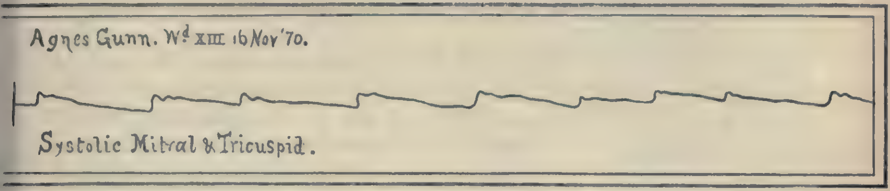
These cases exhibit in a marked manner the extreme importance of great irregularity of the pulse and cardiac action as a symptom of mitral stenosis, especially when associated with hæmoptysis; and though extremely suspicious under all circumstances, these symptoms may, I believe, be regarded as quite pathognomonic when accompanied by tolerably persistent reduplication of the second sound, particularly if associated with presystolic thrill, notwithstanding the absence of all murmur. The presence of pulmonic accentuation, though never absent in these circumstances, is really a phenomenon of comparatively slight importance in specializing the diagnosis, as it depends entirely upon pulmonic congestion, which may be the result of so many various lesions.

Apart, however, from any presystolic murmur or from any extreme irregularity of the pulse, mitral stenosis is occasionally accompanied solely by a systolic mitral murmur, and it is always a matter of interest, and sometimes of importance, to determine the exact nature of the lesion on which this murmur depends. The two following cases, besides the great individual interest which they possess, are of importance as showing the data upon which this diagnosis may be founded.

CASE 8.—Agnes Gunn, æt. 18, admitted into Ward XIII. on 27th October 1870, complaining of dyspnœa, cough, and spit. There is no history of rheumatism, but she had suffered from chorea about two years ago. About twelve months ago she was admitted with symptoms similar to the present into Ward XI. under Dr Laycock, and in the record of her case it is stated that there was then a mitral murmur succeeding and partially replacing the first sound, and that the tricuspid dulness was increased. At the date of admission under my care, her face was observed to be full, puffy, and rather livid, her expression dull and heavy, yet not free from anxiety. There was some swelling of the feet and legs, great dyspnœa, considerable hard cough, and copious watery expectoration. On passing the hand over the lower part of the sternum, the right side of the heart was fouud to beat with a slow heaving pulsation, the left apex being only faintly felt in its normal position between the fifth and sixth ribs, the impulse between the third and fourth interspaces on the left side being felt to be greater than normal. On percussion, the cardiac dulness was found to extend at one inch from the sternum from the upper border of the third rib down to the liver dulness; and on a level with the fourth rib, from one inch to the right of the sternum transversely across for a distance of six inches. On auscultation in the mitral area, the apex beat is found to be accompanied by a slight thump, followed by a bruit which replaces the first sound; the second sound is distinctly audible at the apex; this systolic murmur is lost as we pass to the left, and, about the middle of the infra-axillary space, is replaced by an impure first sound, which continues audible on auscultating round to the base of the scapula. Over the tricuspid area, a loud blowing murmur completely replaces the first sound. At the base, between the second and third ribs on the right side, an impure first sound is heard followed by a feeble second; between the second and third ribs on the left side, the first sound is also impure, and followed by a distinctly accentuated second sound. There is no venous pulsation in the neck, but the veins are somewhat small, empty, and obscured by the general turgidity. The pulse is 76, small, weak, and somewhat irregular; its character is graphically represented in the annexed diagram (fig. 2). She continued under treatment, mainly with digitalis and squill, till the 29th December, when she was discharged, relieved from her more urgent symptoms.

In this case the main elements relied on in proof of the existence of mitral stenosis were — 1*st*, The slight thump preceding the

Fig. 2.



systolic bruit, and constituting, as it were, an imperfect and abortive attempt at a first sound, a phenomenon which in my experience is never absent in such cases of mitral stenosis as have no presystolic murmur attending them, quite apart from the existence of any systolic murmur, and which very possibly is in some cases merely the tail of the rough auriculo-systolic murmur, which it phonetically exactly represents, but it is too sharp and short for my ear, at least, accurately to time; in other cases it undoubtedly is due to the imperfect closure of the mitral valve, as can be accurately enough ascertained by timing it by the carotid pulse, the thump in such cases being more prolonged. 2*d*, The fact that the soft systolic murmur was not distinctly propagated past the middle of the infra-axillary space. This is, according to my experience, an invariable accompaniment of mitral stenosis; not that the systolic murmur is altogether lost, but that the remnant of the first sound is so much more distinctly propagated, that it speedily becomes merely an impure first sound, in which the systolic blow is more or less distinctly to be recognised according to the amount of regurgitation present. In the pure regurgitant murmur this is never the case; the murmur may become fainter as we pass to the angle of the scapula, but it never assumes any of the elements of a first sound. These two phenomena are to me distinctive, and are never observed save when mitral obstruction is present. As corroborative phenomena, we had the early occurrence and rapid development of dilatation of the right side of the heart, proving the obstacle to the onward flow of the blood, an obstacle still further evinced by the diminished arterial pulse (*vide* upstroke in fig. 2), the weakened sound of the closure of the aortic valves, and the persistence of the pulmonic accentuation, notwithstanding considerable tricuspid regurgitation, as evinced by the loud systolic tricuspid murmur. This proof derived from the state of the right side is even more strong in cases in which there never has been any coexistent bronchitis, as is occasionally observed.[1] And even in this case, though there was evidently great pulmonary congestion and copious expectoration of watery fluid, yet the absence of rhonchi and the rarity of crepitation showed that this condition was much more allied to the general turgescent œdema of the body than to true bronchitis; that it was, in fact, more an œdema of the lung than a true catarrhal condition, and therefore all the more valuable a proof of obstructed circulation.

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[1] Especially in Ellen Harkins, admitted into Ward XIII. on 20th April, and discharged improved on 17th June 1871. In her we had all the percussion signs of tricuspid dilatation with distinct jugular pulsation, but no tricuspid bruit, and an entire absence of any history of bronchitis.

On 27th March 1871, Agnes Gunn was readmitted for an exacerbation of all her symptoms, induced about a month previously by going on a cold day from the wash-tub to an outside well while scantily clothed. Her cough, shortness of breath, watery expectoration, and cardiac distress were much increased; the jugular veins, though still small, were now seen to pulsate distinctly synchronously with the heart, and her face, neck, and limbs, but especially her lower ones, were very œdematous. The condition of her cardiac organ was much as formerly, with this exception, that now the apex beat was very distinctly to be felt, and the result of this was that the impulse at the lower part of the sternum was apparently lessened. This was explained to be probably due to increased hypertrophy and dilatation of the right ventricle, which had pushed the left wholly backwards, the right apex being now the only one to be felt. It is obvious that this was the only explanation admissible in the face of an increasing cardiac affection, now fast becoming serious, and so largely implicating the right heart from the first, it was impossible to conclude that a left ventricle, defectively nourished and unable to hold its own from the first, could recover itself and again re-assert its position apart from any well-marked evidence of improvement in the onward circulation, which was entirely absent, while the view taken was perfectly consistent with the ordinary progress of such cases, though the change effected is only rarely observed in such an extreme degree. Gunn remained in the ward till her death, on the morning of 12th July. During this period she had an attack of hemi-chorea, the sufferings induced by it being rapidly subdued by hydrate of chloral and full doses of arsenic; but it persisted for many weeks as a slight twitching of the thumb and forefinger of the right hand, finally disappearing, however, many weeks before death. This choreic attack, however, rapidly broke down her cardiac power, and she never rallied, dying under symptoms of pulmonary apoplexy, with gradually increasing cardiac asthenia. The autopsy was made on 13th July, thirty hours after death. Her body was moderately fat, her legs very œdematous, her face and lips livid. On opening the thorax, the pericardium was found to be distended by from 15 to 20 ounces of very slightly turbid serum. The heart was considerably enlarged, weighing 16½ oz.; the right ventricle concealed the left, and formed the apex of the heart; it was much dilated and its walls hypertrophied, measuring half an inch in thickness; the tricuspid valve was slightly dilated, admitting five fingers easily; on its right cusp, near the free margin, there was a small vegetation about the size of a millet seed, soft and elastic; the right auricle was greatly dilated, not hypertrophied; the aortic valves were competent; the left ventricle slightly hypertrophied, not dilated; the opening of the mitral valve was so extremely contracted as only to permit the point of the little finger; it was very much thickened, and its cusps glued together by their margins; on the auricular surface of each cusp there was a row of small vegetations like millet seeds; the left auricle was slightly dilated, and its walls much hypertrophied, being about twice their natural thickness. The left lung contained two large and recent hæmorrhagic clots, presenting on section a dark venous surface; one of these was situate along the anterior margin of the superior lobe, extending from the apex downwards for a distance of four inches, while it measured transversely one inch and a half; the other was situate in the inferior lobe, near its anterior margin, and was about the size of a large orange; its circumference was pretty sharply defined. The right lung contained no recent extravasations, but in the inferior lobe, immediately beneath the middle of its external surface, there was a yellowish-gray patch of a wedge shape, with its base to the pleura, evidently the remains of an old hæmorrhage; over the surface of this lung, and especially at its anterior margins, there were some emphysematous patches. The liver weighed 4 lbs. 2 oz., was much congested, and slightly cirrhotic, the lobules being very distinctly differentiated by the interlobular cellular tissue. The spleen weighed 5 oz., was of firm texture, and contained two hæmorrhagic infarcti, each about the size of a walnut, tough in texture, and of a bright yellow colour. The kidneys were healthy, and weighed each 5½ oz. The dissection in this case, therefore, completely confirmed the diagnosis during life, while the marked hypertrophy of the left auricle, in contradistinction to the simply dilated condition of the right auricle, in spite of the great preponderance of regurgitation on the right side, seems an evident physiological proof of the influence of obstruction in originating the disease—a proof which, I may add, is never wanting in any case of mitral stenosis, though, as a further evidence of its importance, it is always found to vary in degree according to the amount of obstruction present.

The next case which I shall quote is also very instructive as to the signs of stenosis where only the murmur of regurgitation is present. Case 9.—Alex. Milne, a printer, aged 17, admitted into Ward V. on 28th November 1870, complaining of palpitation, cough, shortness of breath, and pain in the cardiac region. His history was, that similar cardiac symptoms had troubled him from the age of six, and that to these a cough had been superadded about a year ago; since this time the pain in the cardiac region had been much worse; the patient was pale and anæmic-looking, he has never had rheumatism, his family history was unimportant. On inspection, greater pulsation than natural was visible over the cardiac region, especially at its lower part; the apex beat was distinct between the fifth and sixth ribs, 2⅝ inches from the left edge of the sternum; on percussing downwards one inch from the left edge of the sternum, cardiac dulness was found to commence at the upper edge of the third rib, and extended down to the liver dulness; on a level with the fourth rib the transverse dulness did not commence till the left edge of the sternum, but extended to the left for a distance of fully three inches; on auscultating over the mitral area, the first portion of a first sound was heard, followed by a loud systolic bruit, and closed by an imperfectly-heard second sound; this systolic murmur is propagated to the right, and is heard distinctly over every part of the right ventricle, followed by a reduplicated second sound, but is not so distinctly propagated to the left, becoming very faint after passing the centre of the infra-axillary space; over the right ventricle a slight but distinct heaving is conveyed to the ear by the stethoscope; between the second and third ribs, on the left side, distinct accentuation of the pulmonary portion of the second sound is audible, the second sound being here reduplicate, as it is also heard to be between the second and third ribs on the right side, where the aortic portion is heard tolerably natural. Over the jugular veins a hæmic murmur is audible, but no pulsation is visible. The pulmonary physical signs were normal, and the cough left him entirely after a short residence in the Infirmary. His digestive system is normal, except that he has little appetite for food. The urine is, however, smoky, contains numerous blood-corpuscles, a few small granular casts, and one-sixth of albumen.

The peculiar character of the first sound, the mode in which the systolic murmur was propagated, and the persistent reduplication of the second sound, gave me reason to state that in this case also we had to do with mitral constriction; while the tricuspid bruit and evident dilatation, with hypertrophy of the right side, gave a seriousness to the prognosis, which was not lessened by the persistent hæmaturia and the anæmic condition of the patient.

Under treatment his cough speedily ceased, his cardiac symptoms moderated, the pain ceasing, and even his kidney symptoms were modified, the tube-casts being no longer to be found, and the hæmaturia lessened, while his general health was much improved. He was sent to the Convalescent Hospital on 23d February. After being some time at home Milne became gradually worse, weaker, and more distressed by his cardiac symptoms, and he was in this state readmitted into Ward V. on 6th April 1871. His cardiac symptoms were unaltered, but his debility was greatly increased. His hæmaturia continued, and there was a good deal of general œdema. He was very shortly afterwards confined to bed, suffering much from orthopnœa; and after lingering on in this state he died exhausted on the 24th of May, having spitten a good deal of blood during the last few days of his life. At the autopsy there was found great general œdema of the body; the face, which had been livid before death, had become of a roseate hue; a quantity of froth exuded from the mouth; over both lungs there were numerous pleuritic adhesions; the left lung was congested and œdematous; the inferior lobe of the right lung was hepatized, the middle lobe partially consolidated, and the base of the upper lobe also partially consolidated and wholly œdematous. The heart weighed 22 oz. The pericardium was universally adherent—the adhesions tough and fibrous; the right side was dilated and filled with dark clot, the tricuspid opening admitting 5½ fingers; the left side was excentrically hypertrophied and filled with a tough and partially decolorized clot; the mitral opening was constricted, admitting only one finger and a half, its cusps adherent and greatly thickened; the aortic valves were competent. The nutmeg liver weighed 3 lbs. 9 oz., the spleen weighed 12 oz., the kidneys weighed each 6½ oz.; they were enlarged, the capsules non-adherent, the surface a marbled-gray, studded with stellate vessels and hæmorrhagic spots, cortical portion speckled with yellowish opacities.

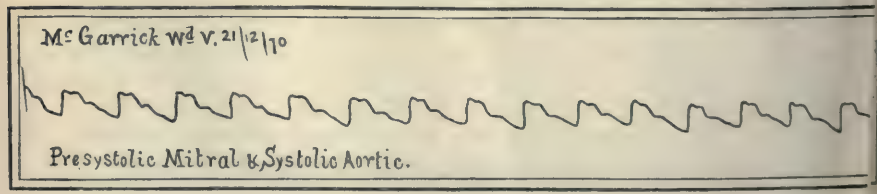
These cases, which might be largely increased in number, are sufficient to show the signs upon which I rely for the diagnosis of mitral stenosis where no murmur, or where only a murmur of regurgitation, is to be heard; they are, I believe, perfectly reliable, and are of importance, not only in regard to accuracy of diagnosis, but also for the prognosis, and still more for the treatment, of the case.

It will have been observed from the cases narrated, that a simple stenotic condition of the mitral valve leaves the left ventricle comparatively unaffected; but inasmuch as this is a rather rare state of matters, the left ventricle is usually found to be secondarily somewhat hypertrophied, this condition being due to the obstruction caused by hepatic cirrhosis as in Case 8, by disease of the kidneys as in Case 2, or by adherent pericardium as in Case 9, or by some obstruction in the aorta, as in the following case.

CASE 10.—James M'Carrick, a brassfounder, æt. 18, first admitted into Ward V. on 25th October 1869, complaining of shortness of breath, palpitation, and hæmoptysis. Patient states that about a month ago, while wheeling a barrow up a hill, he lost his breath, was suddenly seized with a cough, and spat up some blood. The cough improved under treatment, but was always accompanied by expectoration of blood, and his dyspnœa on going up hill continued. Previous to this attack he had always been well, except that he has had measles, scarlatina, and enteric fever; he has never had rheumatism. His family history is good. He is short and slightly built, but his expression is natural, as is also his external conformation. His pulse is 86, and somewhat jerking. Heart's apex beats somewhat forcibly a little inside of the nipple line between the fifth and sixth ribs; on placing the hand over the precardial region a rough purring thrill is felt to precede and run up to the apex beat. One inch from the sternum the cardiac dulness commences at the upper edge of the third rib, and runs down to the liver dulness, and in the line of the fourth rib it extends from the left edge of the sternum to near the nipple for a distance of three inches. On auscultation over the mitral area a loud purring murmur is heard passing into a soft blowing one; the rough portion of this murmur, tested by the carotid pulse, is auriculo-systolic in time, the soft-blowing portion ventriculo-systolic, and replaces the first sound, the two being separated by the impulse of the apex; a loud diastolic murmur is also heard, which becomes more distinct as you pass the stethoscope towards the base, where it is heard to follow the second sound, which is so faint that it almost seems to be obscure. In the aortic area there is a loud systolic bruit propagated into the arteries of the neck. The second sound is audible but somewhat weakened. In the pulmonic area the second sound is accentuated. A few bubbling râles were heard here and there over the lungs, otherwise his condition was normal, except that he had some *jactitatio e somno.* By 5th November his hæmoptysis had ceased, and he gradually improved till 7th December, when he was discharged.

On 16th December 1870 he was readmitted on account of increased cough, dyspnœa, and palpitation; no hæmoptysis. Since his discharge he has been constantly working, though obliged to be careful, and occasionally laid aside by dyspnœa for a day or two, but never for longer than a week at a time. On inspection a heaving impulse is seen and felt between the fifth and sixth ribs in a line with the nipple. This impulse is strictly localized, occupies a space two inches in width, and elevates the chest walls a full quarter of an inch; a purring tremor is felt over this region preceding the impulse. One inch from the sternum the cardiac dulness extends from the upper border of the third rib to liver dulness, and extends transversely from about one inch to the right of the sternum for a distance of five inches. On auscultation over the mitral area a loud purring murmur, auriculo-systolic in time, is heard running up to the apex beat, and followed by an impure first sound, no systolic murmur being now audible. In the aortic area a loud systolic murmur is audible, which is propagated into the arteries of the neck; the closure of the aortic valves is distinctly heard, but somewhat more feebly than usual, and followed by a faint diastolic murmur feebly audible over all the cardiac area, but most distinctly heard just where the fourth rib joins the sternum on the left side. In the pulmonic area, the systolic murmur is heard (propagated) followed by an accentuated second sound, and that by the faint diastolic murmur already described. The pulse is 84, small, soft, and without jerk, neither does it become jerky on elevating the arm; it is graphically represented as follows:—

Fig. 3.


Mc Garrick Wd V. 21/12/70
Presystolic Mitral & Systolic Aortic.

He had some cough when admitted, but was otherwise normal. Treatment again restored him to a state of comparative health, but not so perfectly as formerly, as during the past year he has repeatedly called for advice, and is now again in Ward V., having been readmitted on 25th November 1871. He does not seem to have grown any since he first came under treatment; he looks pale and thin, and complains much of debility; his cardiac phenomena are unchanged, except that the diastolic murmur is much more feeble and more distinctly localized to the spot indicated by the junction of the fourth rib on the left side with the sternum. This case is especially instructive in three respects—1*st*, It shows the influence of obstruction in developing hypertrophy behind it as exhibited in the greatly increased force and extent of the apex beat, distinctly that of the left ventricle as shown by the absence of any increased influence of the lower part of the sternum or of any systolic bruit developed there; 2*d*, It shows the influence of persistent mitral stenosis in developing dilatations of the right ventricle, evinced by the increased breadth of dulness; and, 3*d*, It shows in a very marked manner the non-importance of mere murmurs as signs of organic disease in comparison with the other physical signs. Here we had a loud systolic apex murmur which has completely disappeared, the physical cause of this unquestionably persisting, as revealed by the permanence of the presystolic murmur; but we had also a diastolic murmur so loud and extensive in its propagations as to simulate so fully aortic regurgitation that in the earliest report of the case it is referred "probably" to this cause,—the jerking nature of the pulse, due to pulmonary hæmorrhage, contributing an important quota to this "probably;" yet now it is restricted to a limited area directly over the mitral valve, and from the distinctly audible closure of both sets of sigmoid valves, the absence of every other sign of aortic regurgitation from the pulse (there being neither distinct delay nor jerking), or from the heart (dilatation of left ventricle in excess of hypertrophy), and its common occurrence as a mere symptom of mitral stenosis, as already described (p. 442, etc., *antea*), it is most probably to be referred to the latter cause alone. It might, indeed, depend on a mere opening—ruptured aneurism or other lesion—in the aortic valves; but in that case the increased hypertrophy of the left ventricle would rather have intensified than lessened the murmur, especially if we consider the comparative invariability of aortic regurgitant murmurs,[1] while the variablity of mitral murmurs, as evinced in this as well as in other cases, coupled with the persistent absence of other physical signs of aortic regurgitation, is a very strong argument in favour of its purely mitral origin.

Cases of mitral stenosis are of such frequent occurrence that I could readily multiply these narratives; I have selected a few only, the history of which seems to me to bear importantly upon the diagnosis, and I have only in so far selected them as they happened to present themselves to my memory, for I possess many records of at least as much importance as those narrated. The next case I shall relate has a bearing on the prognosis respecting which sufficient data are still wanting.

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[1] *Vide* Dr Sanders on the Variations of Organic Cardiac Murmurs, *Ed. Med. Jour.*, January 1868, p. 566.

CASE 11.—Andrew Ormiston, a miner, aged 18, admitted into Ward V., on 1st November 1869, complaining of shortness of breath, and pain in the cardiac region. Patient states that he has been ailing for about a year, but before that was always in good health, with the exception of having had chickenpox and scarlatina in childhood—in particular, has never suffered from rheumatism. He has been in hospital once during the past year for similar complaints. He is troubled with shortness of breath, aggravated by exertion or coughing; his expectoration is grayish, but sometimes bloody. He has occasional paroxysms of pain in the epigastrium, coming on about half-an-hour after taking food. He is small for his years, but of a ruddy countenance and fresh healthy appearance. He is pigeon-breasted, the chest being flattened laterally; on palpation a thrill is felt over the heart's apex preceding its impulse. Cardiac dulness extends from the upper edge of the third rib to the liver dulness, and transversely along the upper border of the fourth rib from the right edge of the sternum to the nipple, a distance of 4½ inches. On auscultating over the mitral area a well-marked rough bruit is heard preceding and running up to the first sound; the pulmonary second sound is accentuated, the aortic somewhat weakened. The accentuation of the pulmonary sound is markedly increased whenever he happens to have a cough, and also after exertion. Pulse 88, soft, and only slightly irregular. Respiratory system normal. Tongue clean, appetite variable, bowels regular, urine normal. During his residence in hospital his general symptoms varied according as he suffered from catarrhal complication or not, or from temporary dyspepsia. He was sent improved to the Convalescent Hospital on 15th December. He was recommended to give up mining, and if possible to procure some easy indoor occupation. For some time he took charge of a library; latterly he has been assisting in a grocer's shop. I have seen him frequently since his discharge, and once quite recently. He has grown considerably, and is now a well-grown, healthy-looking lad of his years, though quite unfit for the ordinary exertion of manual labour, his sufferings being always increased by any unusual exertion. The peculiarity and importance of this case is, that he is a contemporary of Cases 9 and 10, that he presents similar symptoms *quoad* the mitral valve itself, but has no complication cardiac or otherwise, that he has been enabled to take considerable care of himself, and that the result is, that he is still alive, and presents none but local symptoms of the cardiac disease under which he labours, showing that under even tolerably favourable circumstances uncomplicated mitral stenosis is not incompatible with life and a moderate share of health; but this, which might be shown by the record of many similar living cases, is perhaps best proved, *quoad* life at least, by the comparative infrequency of mitral stenosis as a cause of death in the pathological theatre, compared with its frequency as a symptom of disease in the wards—a fact borne out by your own daily experience, coupled with that of the Pathologist of our Infirmary.

You will remember, then, that mitral stenosis is to be recognised by the existence of a rough murmur preceding and running up to the apex beat and the carotid pulse, which is pathognomonic of this lesion; that this murmur may, and often does, commence as a soft, blowing, and sometimes musical diastolic murmur following the second sound, becoming rougher towards its conclusion, audible sometimes over the whole cardiac area, more usually, *quoad* its diastolic portion, just over the mitral valve where the fourth rib on the left joins the sternum; that any portion of this prolonged murmur may be absent, and that it may either be continuous or broken by a pause equivalent as to rhythm, though not as to duration, to the normal pause of the heart's action, the length of the pause being dependent on the amount of stenosis present, *i.e.*, the shorter the pause the greater the stenosis; that to be distinctive of mitral lesion a diastolic murmur must be unaccompanied by any signs of aortic regurgitation, must have a clear second sound preceding it, and be accompanied by no jerking thrill of the pulse increased or produced by elevation of the arm, and no dilatation of the left ventricle evinced by depression of the apex beat; the distinctive signs of pulmonary regurgitation are unknown, but the affection is so extremely rare that it may be practically excluded. That extreme irregularity of the pulse associated with pyrexia is indicative of the possible existence of mitral stenosis, and this is corroborated by the existence of a thump preceding or accompanying the apex beat, by hæmoptysis, signs of enlargement of the right side of the heart, and accentuation of the pulmonary second sound. That a simple systolic apex bruit to be indicative of stenosis of the mitral valve must be accompanied or preceded by a more or less evident thump, the bruit ceasing at or about the middle of the infra-axillary space; being there replaced by a more or less impure first sound, the diagnosis of stenosis in such cases being confirmed by great irregularity of the pulse, and by great accentuation of the pulmonary second sound, and especially if accompanied by evidence of tricuspid regurgitation, and the other signs and symptoms of dilatation of the right heart.

Persistent reduplication of the second sound, though in itself comparatively unimportant, is always to be regarded as strong confirmatory proof of mitral stenosis when it accompanies any of the phenomena just described.

The etiology of mitral stenosis is as yet wholly unknown. This much alone is certain, that in the vast majority of cases it is wholly unaccompanied by any preceding history of rheumatism.

The prognosis is equally uncertain. Simple, uncomplicated, mitral stenosis is not a disease of itself very fatal to longevity. Judging from my own experience, I should say that a deduction of one-third from the mean future expectancy of life is quite within the mark, and more likely to be exceeded than the reverse. Any cardiac complication, however, will materially reduce this expectancy, while intercurrent, though apparently irrelevant, complications are also of course liable to produce a similar effect. Comparing it therefore with other cardiac diseases, my own experience would lead me to place it in regard to life expectancy as second in the roll—aortic obstruction, mitral obstruction, aortic regurgitation. In purely hospital practice, aortic regurgitation is by far the most fatal of cardiac valvular diseases. So far as expectancy of life is concerned in this disease, however, the experience of private practice is required to correct that obtained in hospitals; and mitral regurgitation being the order of fatality in which such diseases ordinarily follow each other in a pathological register, consecutive disease of the right side of the heart being the true test of expectancy of death in all except aortic regurgitation, in which, as I shall by-and-by show, certain causes exist which lessen the value of the symptoms of this affection, or rather render their absence of less importance in prognosis.

The treatment of this disease I shall reserve till I come to speak of the treatment of valvular heart affections generally.

ARTICLE VI.—*On the Treatment of Club-Foot.* By THOMAS ANNANDALE,, F.R.S.E., Surgeon to the Royal Infirmary, and Lecturer on Clinical Surgery.

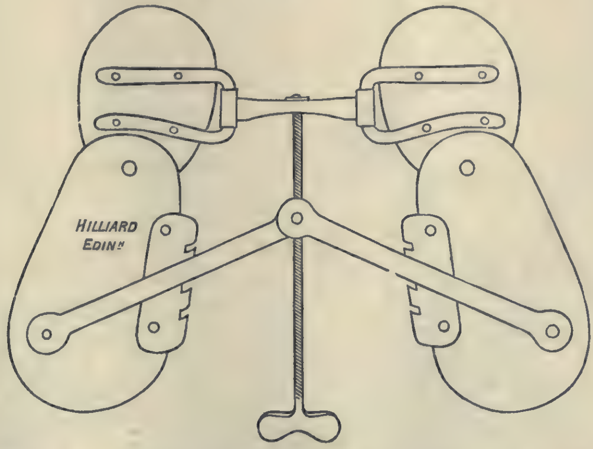
FURTHER experience in the treatment of club-foot has led me to modify and improve the apparatus described and figured in the Journal for February 1869. The two principal obstacles encountered in the treatment of talipes varus by means of a simple apparatus not carried above the knee are—1*st*, The difficulty of retaining the appliance in position, owing to the constant movements of the parts and restlessness of the patient. 2*d*, The difficulty of acting effectually upon the inversion of the anterior portion of the foot, and, at the same time, preventing the rotation inwards of the whole leg.

Finding that my former apparatus was not thoroughly efficient in overcoming these difficulties, I have endeavoured, during the last two years, to perfect it, and have, by means of the improved appliance, obtained the best possible results.

The adaptation to the sole-plate of a soft leather boot, lacing in front, was the first improvement to my former apparatus in regard to the better fixing of the foot; but as even this was not completely efficient, I took advantage of a suggestion which has been formerly made (not by myself), that the two feet should, in some way, be secured together. This latter addition has proved most valuable, not only in restraining the movements of the parts, and so preventing the displacement of the apparatus, but also in furnishing a powerful and successful means of acting upon the inversion of the foot and rotation of the leg, and I now use it in all cases of single and double talipes varus.

In fig. 1 is illustrated the under surface of the sole-plate, showing the method of connecting the double apparatus, and the screw by means of which the anterior portion of the sole-plate, connected to the posterior by a movable joint, can be gradually inverted or everted according to the direction in which the handle of the screw is turned.

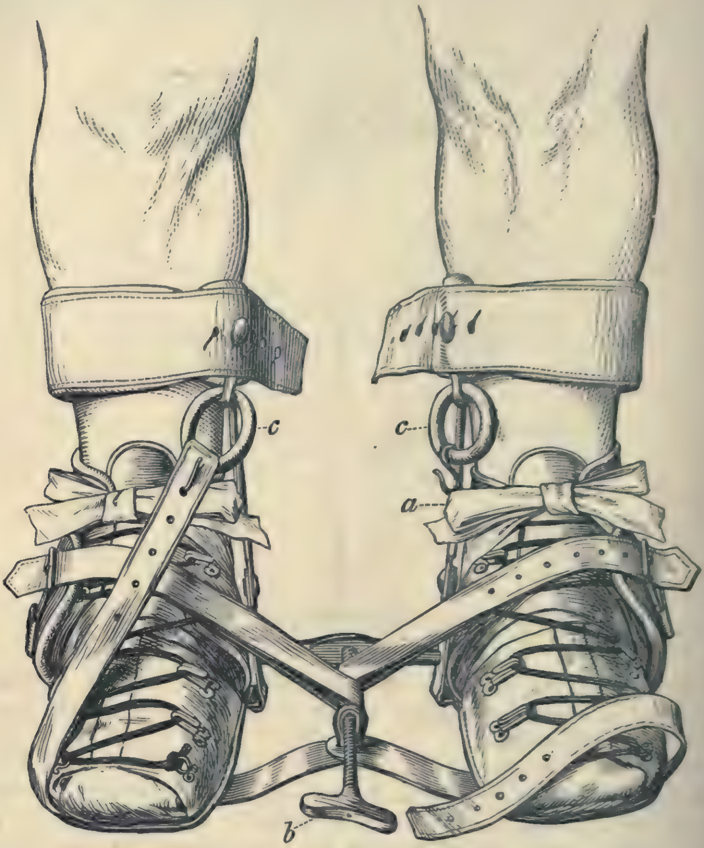
Fig. 1.



In fig. 2 the apparatus is shown applied to the feet. When the feet have been secured to the sole-plate by means of the laced boot, and a special padded strap for securing the heel adjusted (the ends of this strap, which crosses over the dorsum of the foot, are carried round the back of the heel through a ring in the sole-plate, and then brought again in front and tied together, as seen at *a*), a second padded strap, placed over the outer aspect of the posterior portion of the foot is applied; and then, by turning the handle of the screw (*b*), the deformity of the foot can be steadily and progressively acted upon. At *c* is a strong indian-rubber ring, to which a strap attached to the anterior portion of the sole-plate is connected, so as to act by drawing up the foot, and overcoming the contraction of the tendo Achillis.

With the assistance of this apparatus I have already treated, most successfully, several cases of talipes varus in the infant, and also three very aggravated examples of the same deformity in older patients. In all the cases, I have found it necessary first to divide the tendo Achillis, but have not required to interfere with the tendons of the tibialis anticus and posticus muscles, as the contraction of these muscles has been gradually overcome by means of the screw.

Fig. 2.

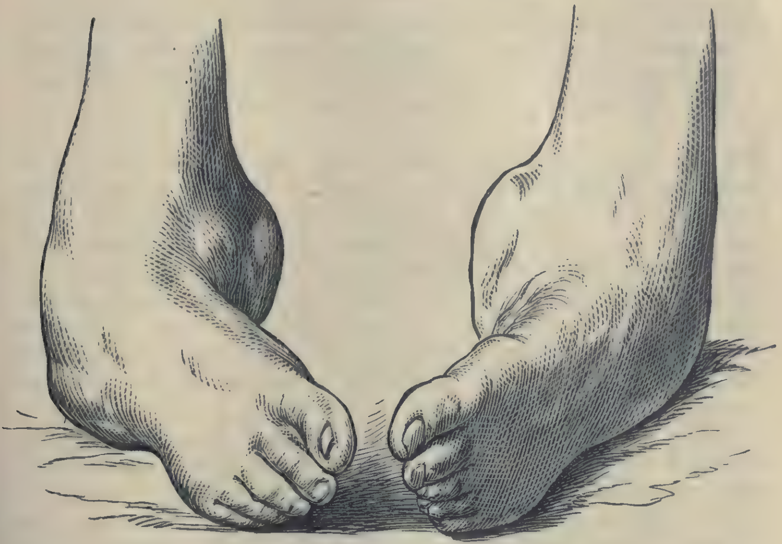


From the results obtained in these cases, I feel sure that it will rarely be necessary to divide the tibial tendons in treating cases of talipes varus in the manner recommended, but the division of the tendo Achillis has been a very essential aid in the cure of the deformity in all the cases. In some of the cases, too, the division of the plantar fascia, or portions of it, has been an assistance in the treatment.

I still advise that the treatment of this deformity should not be commenced before the second or third months of life. From six weeks to three months, according to the severity of the distortion, is the time I have found it necessary to employ the apparatus. As soon as the deformity has been in this way relieved, and the patient is of an age when walking ought to be practised, an ordinary strong boot, with some simple side support, should be worn until the foot has become strengthened in its proper position. The apparatus should be regularly removed during its use, and the foot and leg rubbed and washed, and the various joints exercised with the hand.

Fig. 3 is from the casts of the feet of one of the aggravated cases lately treated with this apparatus. The patient was a girl, æt. 9 years, who had been twice operated upon before she came under my care, but without any satisfactory result. Both feet were well-marked examples of the deformity caused by neglected talipes varus.

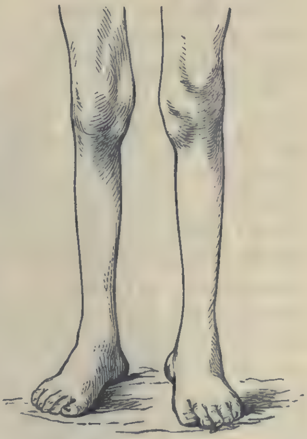
Fig. 3.



After division of the tendo Achillis and portions of the plantar fascia in both feet, the apparatus was applied when the wounds were healed, and diligently employed for a little more than three months. At the end of this time the deformity in both feet was found to be cured, and the patient was able to place the soles of the feet properly on the ground and walk with them so.

Fig. 4 is from a photograph of this patient's legs and feet, taken on the completion of the cure.

Fig. 4.



Part Second.

REVIEWS.

Anæsthesia, Hospitalism, Hermaphroditism, and a Proposal to Stamp out Smallpox and other Contagious Diseases. By Sir JAMES Y. SIMPSON, Bart., etc. Edited by Sir W. G. SIMPSON, Bart., etc. Edinburgh: Adam and Charles Black: 1871.

SIR WALTER GRINDLAY SIMPSON has had an easy task to perform, and he has done it well. To collect and arrange his father's already printed papers was a pleasant exercise of the piety of the son. He has evidently been constrained, by the smallness of the mass of Anæsthesia and Hospital papers, to swell out the volume by the very elaborate memoir on Hermaphroditism, which first appeared in the *Cyclopædia of Anatomy and Physiology.* The whole form a good large volume, the second of the three destined to form the chief, and a highly creditable memorial of the diligence, energy, and talents of the deceased baronet.

When the Anæsthesia papers first appeared in a collected form in this country thirteen years ago, we described them as having, on the wings of fame, carried the name of Dr Simpson to every quarter of the globe, and to the bosoms of myriads of the afflicted. The harvest of fame and of money which Sir James Simpson reaped was truly enormous, and enough to overwhelm most people. But while no one has sought to detract from his great merits in connexion with anæsthesia, there has been, and there continues to be, a good deal of discussion as to his place among the list of the modern successful and original practitioners of this art—Wells, Morton, Jackson, Waldie, Simpson, Flourens, and others.

When the practice of anæsthesia was begun in America by Wells, who employed nitrous oxide, nothing was heard of it here. But when its successful and general use was commenced under the auspices of Morton and Jackson, who employed sulphuric ether, it was soon caught up by Liston in London, and the practice spread abroad with electric speed. Its application in midwifery was a matter of course; and Dubois in Paris, and Simpson in Edinburgh, immediately set about it almost simultaneously. But the early bird gets the early worm, and Simpson took the lead, publishing at once his paper on the Employment of Sulphuric Ether to allay the Pains of Parturition. He got it translated into French, and quickly published in the *Union Medicale.*

The agent was an ether. Might there not be other agents equally or more potent and useful? Already many chemists, physiologists, physicians, and surgeons were on the alert, trying a variety of chemicals which could be respired. Who should first pounce upon chloroform? Several were looking at it, had it indeed in their hands, and were trying it. But again comes in the proverb about the early bird, and Simpson sprang into print before them all, reaping the reward of his diligence and energy, and connecting his name inseparably as a discoverer with the introduction of the new anæsthetic agent. The agent at once became popular, and Simpson's name has naturally always gone with it. Other discoverers of it were not so quicksighted and rapid in their movements as he was, and he outstripped them. Simpson's claim to priority of discovery of chloroform has been contested; and we have no inclination at present to enter on this point. It is quite possible that further evidence may yet be produced regarding it, as many of Simpson's contemporaries and collaborators still live who have published no documents or statements.

Simpson's method of proceeding towards the discovery of the new anæsthetic agent was extremely simple. His knowledge of chemistry was very slender, and could not guide him to the lines of chemical series. He simply set about, without any scientific aid or advantages, to try everything that was respirable, or that, if swallowed, could stupefy. He ranged through the chemicals of Professor Gregory's and of George Wilson's shelves, and of Duncan, Flockhart, and Co.'s shop, and tried everything, from the most volatile ether to coal-gas and the smoke of the puff-ball. In fact, he proceeded as one does who searches for hidden treasure, or as a slave seeks a diamond in the mines of Golconda; and he found it at last. No slaves ever worked harder than he and his assistants did at this time; and it is doubtful whether any of them emerged from the trial with uninjured constitutions. Chloroform was found so much more convenient than ether, that it rapidly supplanted the latter over the greater part of Europe. In America it has never been so generally used as elsewhere, many surgeons and hospitals adhering to the older anæsthetic agent, and preferring it. Indeed, lately, even in this country, ether has found numerous advocates who maintain that its use is less dangerous than the use of chloroform. It is highly probable that this is so; but evidence of sufficient exactness and cogency has not yet been adduced. The settlement of the question is very desirable, and will go far to fix the position of the one agent and of the other in professional esteem.

Ether and its marvellous powers had scarcely had time to take possession of the public mind of this country, when chloroform and Simpson were divulged. The public made no distinction between chloroform and anæsthesia, and thus confusion and injustice arose, Simpson getting the credit not only of chloroform, but of anæsthesia also. Especially was jealousy of this excited in America, which country had undoubted claims to the great discovery of artificial anæsthesia; and this jealousy was not removed, as it might have been, by any writing of Simpson's. On the contrary, it was intensified by his writings, and especially by some words in the article on Chloroform, which he prepared for the last edition of the *Encyclopædia Brittanica.* It was upon these that Dr Bigelow laid stress in his pamphlet on this subject, and with justice.

Simpson identified himself with anæsthesia. His true position, with respect to it, is not as discoverer of it in any respect whatever, but as promulgator, advocate, or apostle. His usual enthusiasm never was so intensified as in his devotion to this great cause, and there should be no jealousy of the great fame he acquired in consequence. It was simply the recognition by the public of the immense and otherwise unrewarded toils that he undertook in a great public cause. It got him his baronetcy. He and a few of his friends were fain to believe that acupressure formed one of his claims to the title. Perhaps it was so at the time. It is not so now, for acupressure is nearly forgotten.

In his anæsthetic apostleship, Simpson's combativeness was strongly exemplified. The student will find much evidence of it in the volume before us, but more in the journals of the period. A death in Newcastle from chloroform was published: he immediately set about explaining it away, printed the explanation, and, at great trouble and expense, sent it, as he sent all his other pamphlets, in bushels, through the post, to his professional and non-professional friends and acquaintances. A notable example of his ways is to be found in his very clever answer to the religious objections to the use of chloroform in midwifery. The fact is, there was no religious objection made that was worthy of the name or of the slightest attention. No good was to come, rather the contrary, from paying any attention to the small, scarcely audible cackle of some geese. But Simpson delighted to assume the pugilistic attitudes, and to fight a bogie if he could not get an opponent worthy of his prowess. He knew absolutely nothing of Hebrew—not even the alphabet—and nearly as little of Biblical criticism; yet he set about button-holing his learned friends, and managed to put together the clever skit to which we have alluded. This pamphlet appears as a chapter in the volume before us. We rather regret this, for there is no note to indicate that it was a mere literary skit. As such it was passable; but literary morality does not approve of a solemn, learned, and critical chapter, in a work intended for future generations, on a subject of which the author was as ignorant as possible. In being so ignorant there was neither dishonour nor disgrace, and the statement of the fact would have tended to increase the estimate of Simpson's great literary cleverness, while it would have avoided the blot.

Of Simpson's papers on Hospitalism we find it difficult to speak. He brought an awful charge against the hospitals of his native country, and he should have been ready with crushing arguments to justify it. These were not forthcoming. In their stead, we have rambling, confused, and confusing chapter on chapter. But

Simpson, though young in years, was decidedly getting old. In his earlier days he brought antiquarian lore, vigour of thought, originality, precision of language into play, and made the best of whatever cause he took in hand. Here he did not appear to advantage. His pen fell prematurely from his hand, and he left the great question of Hospitalism to be settled by a new race of medical inquirers.

The Science and Practice of Surgery. Illustrated by 470 Wood Engravings. By FREDERICK JAMES GANT, F.R.C.S., Surgeon to the Royal Free Hospital, etc. London: J. & A. Churchill: 1871. Pp. 1266.

AN attempt to give an account, be it ever so short and compressed, of the science and art of surgery in one volume is one of considerable boldness, and for its successful performance demands very peculiar natural talents, improved by natural training, and chastened and sharpened by long practice in the art of communicating knowledge.

The incisive brevity of style and the vast experience of the late Mr Syme, rendered his book a wonderful epitome, full of wisdom, and yet easy to read; still he ventured no further than to call it the Principles of Surgery. Mr Holmes's System of Surgery is now contained in five large volumes, and includes the labours of many practised teachers. Gross, Erichsen, Miller, and Pirie have in their systematic works given the cream and sifted grains of many courses of lectures on surgery; the redundancies, deficiencies, and errors of each have, at least, been tried in the furnace of the lecture-room and the ward. Sir W. Fergusson confines himself to Practical Surgery. Mr Spence's long experience both in teaching and hospital only emboldens him so far as to call his *magnum opus* by the modest title of Lectures on Surgery.

When a surgeon who is not as yet known as a teacher offers to the profession a "new and systematic work representing the Science and Practice of Surgery," he not only shows boldness and self-reliance, but challenges an honest criticism on the success of his attempt.

In his preface the author claims some special merits of very great importance. 1. "General Pathology and Surgery, comprising the forms of disease which are common to all parts of the body, *is* (sic) made more comprehensive than in other systematic works." Our dictionary tells us that comprehensive means "including much within narrow limits." This, then, will be a most rare and valuable characteristic, if present. 2. "That by constantly having regard to the selection of essential matter, and pursuing a uniform arrangement, I have simplified and not inconsiderably abridged the size of the work." Also very good.

In the preface the author acknowledges his indebtedness to previous workers, more especially to Mr Holmes's System, and some recently-published standard treatises. We agree with him, that he is *very* much indebted to these works.

The limits of our pages prevent anything like an analysis of such a work as this being given, nor would it be instructive; we would rather try to see how far Mr Gant has succeeded in his high aim, and fulfilled the promises of his preface; and if we have to criticise, even with keenness, we must not forget the extent and the difficulties of the task to which he set himself. 1. Is Mr Gant's General Pathology comprehensive? The introduction consists of a sort of farrago of words, at some points almost degenerating into twaddle, vague, long-winded, inaccurate, and ungrammatical. We use these, apparently harsh, expressions advisedly, and have marked many instances of each. What does the following sentence mean? "In March 1864, I brought prominently forward in my 'Principles of Surgery,' the Guidance of Pathology in Surgical Operations, as a General Principle; positively true in the great majority of operations, where the seats of operation and of disease or injury are identical; negatively true in other operations, where the object is to operate clear of the disease and amid healthy tissues."—Pp. 5, 6. Can human patience bear, in "a comprehensive General Pathology," to be met by time-honoured quotations from John Bell, p. 8; rich crusted anecdotes of Sir Astley Cooper, p. 8; Macartney's views as to contraction of arteries, p. 25; and on the modelling process, pp. 24–28; the last quoted entire?

Inaccurate accounts of Professor Lister's experiments—of Mr Simon's views in 1860—not an allusion, so far as we can discover, to the experiments of Cohnheim, Recklinghausen, or Burdon-Sanderson, on leucocytes—a confused jumble of the opinions of authors, from Travers and Macartney to B. W. Richardson—with long quotations, some even poetical,—lead us to fear that if this is comprehensive in including much within narrow limits, the included material is neither very valuable nor well arranged. Such a view of general pathology could never have been delivered to a class of students without its being at once discovered to be an unintelligible jumble.

We would wish to justify our word "ungrammatical," but will give but one instance, feeling sure that by a little care in the second edition, many of the grammatical inaccuracies which (doubtless *per incuriam*) deform the first will be corrected. "Nitrate of silver, lunar caustic, promotes the resolution of a whitlow, a bunion, a hordeum or stye in the margin of the eyelid; and such like intractable conditions of inflammation."—P. 64.

In many places we have noted old and exploded methods of treatment; some which are almost dangerous may be mentioned. Thus, in the treatment of fractures of the condyles of the humerus with displacement, Mr Gant recommends angular splints to command forearm and arm, and at the end of a month passive motion of the joint; if passive motion be postponed for a month, in many cases it will be too late to prevent stiffness.

In describing Potts's fracture of the fibula, no allusion is made to the risk, in some cases, of displacement of the heel backwards, nor any directions given for treating this displacement.

In the chapter on Diseases of the Eye, we have the old operation of couching described and figured—while Graefe's operation for extraction is not alluded to, nor is iridectomy described.

In describing the performance of thoracentesis, Bowditch's trocar is not even alluded to.

The arrangement of the work is confused, and much valuable space is taken up most unnecessarily by cases which, however interesting in themselves, are out of place in a system of surgery aiming at being comprehensive.

Then, as to diagrams: we are told, on the title-page, that the work contains 470 wood-engravings. So it does; but nearly the whole of them are "old familiar faces." The liberal publishers having put at the author's disposal their collection of wood-blocks, those already used by Cooper, Liston, Fergusson, and Bigg, now adorn Mr Gant's pages. We happen to be rather familiar with the illustrations of surgical works, both at first hand, in this country, and also after they have been pirated or conveyed by our American friends; so in the 470 we search almost in vain for a new face. Fig. 239 we did not recognise as a picture of talipes calcaneus, as it is not like any case of that deformity we have ever seen or heard of, nor in the least like Mr Gant's description of the same; but a careful search discovered it as fig. 257 of Mr Bigg's book on deformities. Fig. 300, illustrating the amputation of the ankle-joint, is the old one, so thoroughly incorrect, to which Sir W. Fergusson has been so faithful: we rejoice to see so many marks of tear and wear on its time-honoured, but mistaken, lines. It soon will not be worth stealing.

A momentary gleam of novelty cheered us in fig. 278, but, alas! it was only another old friend turned upside down. It will, certainly, rather perplex any ingenuous youth who may attempt to reconcile the diagram with the description; but we know it well, and where it first appeared.

Another pair of old acquaintances are introduced in p. 741, to illustrate the old operation of putting a style in the lachrymal duct, as if Mr Bowman's labours had been in vain.

In bringing the ungrateful task of criticism to a close, which might be indefinitely prolonged were there any need, we are confident that the author must be conscious how far he has come short in the very difficult task he has set himself. A wider grasp of principles, a larger experience in teaching, and a little more practice in writing English, are necessary for success in an undertaking of such magnitude as this is, and a less liberal use of paste and scissors, and a more careful selection of old opinions as well as of old diagrams will make the work smaller but more useful.

Could we believe the resemblance between Mr Gant's index and that of Mr Erichsen, pointed at by another critic, to be more than accidental, a more severe style of criticism would be necessary than our gentle suggestions.

Diseases of the Rectum, their Diagnosis and Treatment. By WILLIAM ALLINGHAM, F.R.C.S., Surgeon to St Mark's Hospital. London: J. & A. Churchill.

AFTER some introductory remarks on the relative frequency of the diseases affecting the rectum, and the general means to be employed for their recognition, the author first considers the subject of fistula in ano.

His remarks on the method of examining a case of fistula are excellent, and his hint in regard to the importance of detecting the existence or non-existence of other disease in the canal is well worthy of note.

In connexion with this subject the author makes some interesting observations on "fistula in conjunction with phthisis." He computes that a tubercular affection of the lungs exists in 14 per cent. of all cases of fistula, and in regard to the question of operating in such cases says, "I must not be understood to advocate wholesale indiscriminate operations upon *tuberculous* patients; but I mean that if care be taken in the selection of the proper cases, avoiding interference, if possible, with *rapidly advancing* phthisis, and the operation be performed discreetly at the right time of the year, and with favourable surroundings, the patients will generally do well, and be benefited and not damaged by the cure of their rectal malady."

Hæmorrhoids is the affection next treated of by Mr Allingham, who, after a careful account of the disease, directs attention to cases in which some uterine complication exists, and advises that unless the uterine disease is properly treated, it is useless to operate on the piles.

In his description of the operative treatment of internal piles, the author discusses the various operations which have been suggested. In regard to the treatment with the clamp and cautery, Mr Allingham observes, "I have employed it in more than seventy very varied cases of prolapsus and internal hæmorrhoids; at the same time I beg most strongly to demur to the assertions which have been made by Mr Smith respecting it." He then refers to several cases in which pyæmia and death had followed this operation, and further remarks that his experience is opposed to the assertions of Mr Smith in regard to the rapid recovery and slight suffering after the operation. The author prefers the operation devised by the late Mr Salmon, which consists in separating "the pile from its connexion with the muscular and sub-mucous tissues upon which it rests; the cut is to be made in the sulcus, or white mark which is seen where the skin meets the mucous membrane; and this incision is to be carried up the bowel, and parallel to it, to such a distance that the pile is left connected by an isthmus of vessels and mucous membrane only." After this has been done, a strong silk ligature is to be tied round the neck of the pile. Each pile is to be thus treated separately and then returned within the sphincter.

After some remarks on "hæmorrhage after operations upon piles," and some chapters on fissures, polypus, ulceration, and stricture of the rectum, procidentia recti, pruritus ani, and impaction of fæces, which are all deserving of study, the author considers cancer of the rectum. In this sad disease he advocates the operation of lumbar colotomy as a means of relieving temporarily the painful symptoms. As a result of many dissections, and an experience of thirteen cases in which he has performed this operation for cancer, Mr Allingham gives some very valuable rules for the more certain finding of the colon, in performing Amussat's operation. A brief notice of "rodent ulcer," neuralgia, inflammation, and gonorrhœa of the rectum, conclude the work, which we cordially recommend as well deserving the careful study of physicians and surgeons.

Lectures on the Clinical Uses of Electricity. By J. RUSSELL REYNOLDS, M.D., F.R.S., etc. London: J. and A. Churchill: 1871. Pp. 112.

THESE lectures were delivered during the summer of 1870, in the University College Hospital. They appeared at the time in the pages of *The Lancet*, and are now republished in a revised form. They are, as their name indicates, strictly practical in character, and are confined as closely as possible to ascertained facts in regard to the clinical use of electricity in the diagnosis and treatment of disease. There are hundreds of medical men accustomed to think that they know a little about electricity, and who make use of it practically in the treatment of disease, and who yet have very vague ideas respecting its forms and modes of application, as well as of the various diagnostic and therapeutic uses to which electricity may be applied, as well as of the form most suitable for any special case. For such this handy little book will be both instructive and convenient, as it conveys a great deal of information in small bulk and in clear readable English.

After a few introductory remarks on the clinical uses of electricity, on the limit of its value in diagnosis, and on its degrees of value in therapeutics, Dr Reynolds proceeds to describe the franklinic, galvanic, and faradic forms of electricity, noting shortly how these forms are produced, and how they are best employed. Then follows a notice of what electricity can actually do, 1st, as a purely chemical agent, and 2d, as a so-called vital agent, that is, producing special effects on nerve, muscle, skin, etc. The chapter on the diagnostic uses of electricity, which comes next, is specially instructive, as is also that on its therapeutical applications, which concludes the work. The appendix contains a clear and concise statement of the requirements of an electrical room. The whole work is so terse and compressed that we have thought it better to illustrate its nature by a summary of its contents than by any quotations, which, torn from their context, could only feebly convey the highly practical and generally useful nature of the instruction it contains.

Text-Book of Skin Diseases, by Dr Isidor Neumann. Translated from the Second German Edition by ALFRED PULLER, M.D. Ed. London: Robert Hardwicke: 1871. Pp. 329.

THOSE acquainted with the admirable work of Hebra on diseases of the skin will be at no loss to perceive whence our author has derived his inspiration. Dr Isidor Neumann is very well known as a distinguished exponent of the Vienna school of dermatology; and as the English translation of Hebra has its circulation to a certain extent limited by its forming two of the volumes issued by the new Sydenham Seciety, and therefore not readily procurable by those beyond its pale—whose numbers we hope are few—this volume will be welcomed as a cheaply attainable work, which, moreover, possesses merits peculiarly its own. In particular, we may refer to the sixty-seven woodcuts which illustrate its pages, which are taken from casts of those employed in illustrating the original, and are well executed, clear, and distinct. We cannot, however, pay a similar compliment to the typography, and the paper also is not quite what we are accustomed to, and, but that it is enclosed in cloth boards, resembles much the "fozy" stuff of olden German volumes; while, amongst other errors, the word "conidia" loses all its significance by being so spelled, leading one to think more of dust than of fructification, though possibly something may be said in this respect against its being an absolute error. In speaking of the destruction of lice, often a very necessary operation for the comfort, not only of the patients but of those who may come in contact with them, Dr Neumann recommends cutting the hair short and rubbing the head with petroleum, carbolic acid (1 to 8), and Peruvian balsam; while to preserve the long hair of women, he recommends it being dusted with Sabadilla powder—making no mention whatever of the stavesacre, Delphinium staphisagria, the seeds of which, pounded and made into an ointment with lard, a lotion with vinegar, or a tincture with spirits, form by far the simplest, the most comfortable, and the most efficacious agent for the destruction of lice on the clothes, body, or head we are acquainted with—not only killing the lice, but addling their nits, and, what is of more importance, removing at once that intolerable itching which affects some people for days after a louse has bitten them, or cleaves to the skin in the neighbourhood of the nits so long as they are alive. In common with many dermatologists, he speaks of favus as readily curable by his favourite application, which seems to be epilation, followed by a carbolic acid lotion (1 to 8); and as he seems to have no alternative but friction with turpentine, olive-oil, or croton-oil, we hope it may prove successful. A really good and easily applicable cure for favus is still a desideratum; epilation is good and successful, if rapidly completed, when the parasite is confined to the hair; but when the scalp is infiltrated with spores it is useless. Oil is of no avail, because the spores are found in the sebaceous glands, and are, therefore, able successfully to resist the action of oil; we may, indeed, repress their growth, but we can never thus kill them, for we know that growth may remain in abeyance for thousands of years, and yet start into life so soon as favourable circumstances are attained. Croton-oil, like chromic acid, may throw off both spores and cuticle, the latter being undoubtedly the best means of applying this slowly cauterant action; yet it is not free from danger, as may be readily conceived. On the other hand, turpentine is a very likely substance to permeate and addle the spores, but it is also to many skins rather too great an irritant to be freely applied; but the milder turpentines, styrax and Peruvian balsam, are not irritant, and possibly a combination of them with carbolic acid, which of itself is useless, or only temporarily useful, like oil, may yet be found the most efficacious agent. Certainly nothing as yet known acts in this disease *tuto, cito, et jucunde.*

Neumann states that when styrax and Peruvian balsam are used in itch, the eczematous condition of the skin is not rapidly removed; in this he labours under some mistake, for this mode of treatment is not more remarkable for the rapidity with which the itch insect is destroyed than for the speedy cessation of the accompanying eczema. We cordially recommend this book to our readers as a useful addition to dermatological literature.

An Introduction to Pathology and Morbid Anatomy. By T. HENRY GREEN, M.D. Lond. London: Henry Renshaw: 1871. Pp. 304.

THIS little work forms really an admirable introduction to the subject of which it treats; but it is more, it is actually a condensed special treatise on general pathology, giving first a pretty full account of the general pathology of each process, adding subsequently a shorter notice of the same process as it occurs in the several organs and tissues of the body. The latter part of the work is much too curt to be satisfactory; the former is fuller and more complete; and, pending the publication of that work which will do for medicine what Paget has done for surgery, it may be accepted as a welcome instalment by the British medical student. It is well printed, on good paper; but the state of pathology in Britain may be learned from the fact that by far the larger proportion of its admirable and clearly-printed illustrations are mere copies from those of German authors. The science of pathology is perhaps the most important of all those which are subsidiary to therapeutics, yet how is it looked down upon here. If we teach botany, a handsome income will reward our efforts; if we practise medicine, surgery, or midwifery, we may reckon our income by hundreds; but pathology, upon which all our certainty in medicine is built, is considered amply rewarded by a bare pittance to be reckoned by tens of pounds; and it is a disgrace to the profession that such should be the case.

A Complete History of the Case of the Welsh Fasting Girl, with Comments. By Robert Fowler, M.D. Edin. London: Henry Renshaw: 1871. Pp. 307.

Report on Spiritualism of the London Dialectical Society. London: Longmans, Green, Reader, and Dyer: 1871. Pp. 412.

The Spiritualist. London: July 31, 1871.

The Physics and Physiology of Spiritualism. By W. A. Hammond, M.D., etc. New York: D. Appleton and Co.: 1871. Pp. 86.

We have classed these works together, because the belief that a girl can live without food, and that a man can float through the air, belong to the same category. To inquire into either is to prostitute our reason before the shrine of—quackery, we were about to say; but the word is so often employed as synonymous with the practice of medicine without a diploma, which is not quackery, otherwise Hippocrates would be a quack, that people forget that the term really means deception. Any one who knows aught of physiology, knows that perpetual starvation is incompatible with life, and does not think it necessary to inquire further into any reported case. Dr Fowler's book contains, however, besides a complete history of the painful case of the Welsh girl, much useful information regarding cases of prolonged starvation: it possesses therefore a physiological value altogether apart from its sensational one. The other works, on the other hand, are simply valueless—even that of Dr Hammond, for where a subject possesses neither a physical nor a physiological substratum, it is impossible to supply it by any inquiry directed to that end. Levitation is an old story, dating at least from St Philip Neri in the sixteenth century, yet we have got no further with it than that it is still as inconsistent with physical laws as it then was, still as unproductive of benefit to mankind, still as utterly untruthful as a matter of fact. The words of Algazzeli, with which Hammond concludes his work, sufficiently describe the futility of his labours:—"If, when I have satisfied myself that ten is more than three, some one should say to me, 'Not so; on the contrary three is more than ten, and to prove to you the truth of my assertion I will transform this rod into a snake;' if, then, he should so transform it to my entire conviction, the certainty I should have of his error would not be shaken. His performance would produce in me only an admiration of his skill, but I should not doubt the truth I had acquired." Words which contain a truth we ought all to remember, and which has been very aptly re-stated in recent times. "The new is coming, I doubt not; but it must grow organically out of the old—not root the old up, and stick itself full-grown into the place thereof, like a French tree of liberty—sure of much the same fate. Other foundations can no man lay than that which is laid already, in spiritual things or in physical; as the professor and his school will surely find.

"You recollect to whom the Bible applies that text?

"I do.

"And yet you say you cannot answer the professor?

"I do not care to do so. There are certain root-truths which I know, because they have been discovered and settled for ages; and instead of accepting the challenge of every I-know-not-whom to re-examine them, and begin the world's work all over again, I will test his theories by them; and if they fail to coincide, I will hear no more details of the branches and flowers, for I shall know the root is rotten."[1] We may take levitation as a crucial theory of spiritualism; though not new, it has been recently evolved as a modern phase of this would-be science: pop Mr Home down a coal-pit, and let spiritualism sink or swim—float we should say—along with him.

Lessons in Elementary Physics. By BALFOUR STEWART, LL.D., F.R.S., etc. London: Macmillan and Co.: 1870. Pp. 372.

THIS little book is a perfect *multum in parvo.* Though the type used is small, it is clearly and distinctly printed, and its comparatively few pages contain a great amount of matter; for the accuracy of which the name of the author is a sufficient guarantee. The illustrations are well drawn and carefully printed; and altogether it is not only one of the most comprehensive but one of the most readable works on this important subject.

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[1] Kingsleys "Phaeton."

A Practical Treatise on Bright's Diseases of the Kidneys. By T. GRAINGER STEWART, M.D., F.R.S.E., F.R.C.P.E., Physician to the Royal Infirmary, Lecturer on Clinical Medicine, formerly Pathologist to the Royal Infirmary, and Lecturer on General Pathology, etc., etc. Second Edition. Edinburgh: Bell and Bradfute: 1871.

THE author may be congratulated on the fact that a second edition of his treatise has been so soon required. No better proof need be given that it has been well received by the profession. The present volume is, we perceive, considerably larger than its predecessor, but the form and nature of the contents are the same. The increase is chiefly due to the introduction of illustrative clinical cases, so as to render the series more complete; and some fuller explanations are also given on some questions of pathology, and details of treatment. These additions are improvements, and we have therefore to repeat, in regard to the present edition, the recommendation we gave of the first, as an excellent contribution to the subject of renal disease.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LI.—MEETING II.

Wednesday, 6*th December* 1871.—Dr BENNETT, *President*, in the Chair.

I. *Dr Joseph Bell* showed:—

1. THE BLADDER AND PROSTATE of an aged man who had been under his care for retention of urine, along with profuse and exhausting hæmaturia. The bladder was about four times its natural size. The prostate presented the rare lesion of encephaloid degeneration, being as large as a small apple, soft, and vascular. The anterior portion of the prostatic urethra was dilated, so as to admit nearly two fingers, while just at the entrance into the bladder, an enlarged third lobe projected over and occluded the urethra.

2. THE CONTENTS OF AN ORBIT which he had removed from a female, æt. 60, on account of a melanotic cancer. The eyeball had been excised some months previously, by a surgeon in England, for the same disease, which returned in eyelids and muscles, filling up the whole orbit, and projecting in front. Dr Bell had removed the eyelids and the whole soft parts of the orbit, including the

orbital fascia and periosteum. The patient made a good and rapid recovery, and was quite well when last seen, two months after the operation.

3. A URIC ACID CALCULUS, WEIGHING 2 OUNCES, which he had recently removed by the ordinary lateral operation from an aged farmer. The symptoms had been very severe and of long standing. He made a good recovery.

4. A URIC ACID CALCULUS, COATED BY PHOSPHATES, WEIGHING OVER 6 DRACHMS, which he had recently removed by the lateral operation from a child, æt. 6. The stone was remarkable in its shape and structure, as a bulbous neck occupied the prostatic portion of the urethra, while the pear-shaped body of the stone lay in the bladder. The patient had been cut on a former occasion by the late Mr Syme, and the whole growth of the present stone must have been within eighteen months. He made a good recovery.

5. A MULBERRY CALCULUS, LESS THAN A WALNUT, which he had removed by lithotomy from a ploughman, æt. 60. The symptoms had been of very long standing. An attempt to crush the stone, which had broken it into two halves, created so much irritation as to render lithotomy advisable. The operation was attended by little irritation, and the patient made a rapid recovery.

II. *Dr Muirhead* exhibited the BRAIN of a man, aged 59, who had come into hospital perfectly speechless. After remaining there for five weeks, he gradually recovered articulation, so as to be able to make himself perfectly intelligible and to read distinctly. He was sent to the Convalescent House, and after remaining there about a month, returned to hospital, suffering from general dropsy and an erythematous condition of the skin, which gradually increased; symptoms of pulmonary congestion ultimately set in, and carried off the patient. On examining the brain, an effusion was observed over the whole surface, with a general congestion of the organ. In the middle lobe, on the right side, was observed a triangular depression containing serum, which escaped on puncturing the arachnoid. Externally, on the left side of the brain, on a line continuous with the sylvian fissure, was found a marked softening of two to three inches in length, and one inch in breadth. On examining the middle cerebral artery and its larger branches, no embolism was discovered, though, from the rough examination at that time made, it was impossible to say that no capillary embolisms existed.

The heart, kidneys, and spleen of the same patient were also exhibited. The heart was much hypertrophied, but otherwise tolerably healthy. This state of the organ was, no doubt, due to the intertubular nephritis of the kidney, producing a well-marked specimen of cirrhosis of the kidney. In the spleen was found a recent embolus as well as a cicatrix, indicative of the absorption of a former one.

III. *Dr George W. Balfour* next read his paper, NOTES OF A

CASE OF ENLARGED SPLEEN, SUCCESSFULLY TREATED BY INUNCTION OF THE BINIODIDE OF MERCURY OINTMENT.—This patient, Robert Kilpatrick, an old soldier aged 42, had been many years in India, where he had suffered from syphilis, and from several attacks of ague, having had recurrences of the latter since his return home. During his Indian service he had led rather a dissipated life, and on his return he had been under treatment in Netley Hospital for the disease of which he now complained, but which latterly had much increased. He came under treatment in Ward V., on 14th October 1870, complaining of great tumidity of the abdomen, with a large tumour on the left side; he was also found to have a reducible inguinal hernia; but except that his appetite was poor, his bowels rather costive, and that he had occasional, irregular, and slight attacks of ague, his condition was otherwise normal. On examination, the abdomen was found to be much distended, measuring 46 inches round the umbilicus; with the exception afterwards to be mentioned, it was uniformly soft, yielding, and gave on percussion a clear, full, tympanitic note; the liver dulness was normal, 4 inches vertical in the mammary line, and left lobe not diminished. At the left side a large tumour was to be felt, extending downwards and forwards; the skin was freely movable over it, and on its anterior border a distinct notch was to be felt about 3 inches beneath the ribs. Over this tumour the percussion was dull, extending from its most anterior and depending portion upwards and backwards, to within 3 inches of the spine for a distance of 14 inches, the greatest transverse breadth of the dulness, just beneath the ribs, was 5½ inches. This tumour was regarded as an enlarged spleen of malarious origin, and the patient was directed to rub over it every day a small bit of the ointment of biniodide of mercury, the size of a small horse-bean or large pea, freely exposing his person to the fire during the process. His aguish symptoms were combated by the use of quinine, and subsequently ferruginous tonics, with arsenic. During the process of inunction he suffered much from the heat causing expansion of the intestinal gases, and to relieve this, various carminatives and absorbents were tried—amongst the rest, Belloc's charcoal freely administered—without relief. At last, bethinking myself that possibly the liver, though not appreciably affected, might yet labour under some interstitial derangement capable of lessening the amount of bile secreted, and that the tympanitis might be due to defective digestion, and consequent putrefaction of the food, ox-gall pills were administered shortly after each meal, with the effect of rapidly diminishing the amount of intestinal flatus, and relieving the man's discomfort. The abdominal tension ceased, and the abdominal walls became so flaccid, that the tumour could be readily grasped by the hand. He was dismissed improved, at his own request, on 9th February 1871. On that day his abdominal parietes were quite flaccid; he measured round the umbilicus 34 inches; the large spleen could be felt projecting from beneath the ribs, its hilus being 2½ inches beneath the ribs; the transverse dulness measured 4½ inches, and the longitudinal dulness extended downwards and forwards from a vertical line dropped from the posterior fold of the axilla for a distance of 9½ inches. His health was much improved, and the tumour, as you will perceive, was considerably lessened, while, though he had used the ointment more freely than was desired, he had never been salivated, and only suffered for a day or two from slight soreness of the gums, the result of using the inunction over the tender new skin, following slight vesication, produced by over-zealous application of the remedy. He was supplied with a box of the ointment, and desired to continue its use.

On the 3d of June Kilpatrick was readmitted, labouring under extensive ascites, for which, along with other treatment, he was twice tapped; he died exhausted on 13th July 1871. On this occasion his splenic tumour was felt much reduced, projecting only about two or three inches beyond the ribs, but no exact measurements were taken. At the autopsy on 15th July the body was much emaciated, the skin and conjunctivæ slightly tinged with yellow. The thoracic organs presented no points of interest. The liver looked as if somewhat shrunk, but really weighed 4 lbs. 4 oz.; there were dense perihepatitic adhesions over the whole organ; the surface was extremely irregular, presenting numbers of nodular projections, alternating with puckered depressions, many of the nodules being as large as the segment of a boy's marble. Over the upper surface of the left lobe there was a white stellate cicatrix on the capsule, measuring 1½ inches in its longest diameter; there were also several other cicatricial thickenings, not quite so well marked, over the surface of the right lobe; on section, the surface was apparently distinctly granular and cirrhotic, but the texture, though tough and fibrous, was not stiff as in an ordinary case of cirrhosis, and under the microscope no excess of fibrous tissue could be made out, the several sections examined seeming composed of hepatic cells, with a little free granular matter, and not distinctly differing from healthy liver tissue. The spleen weighed 2 lbs. 3 oz. Over its convex surface there was in the capsule a patch of cartilaginous thickening about 3 inches in diameter, and ¼ of an inch in thickness; there were some perisplenitic adhesions to the diaphragm, the capsule was flaccid, as if the organ had formerly been larger; on section the organ was about normal, neither pulpy nor very fibrous; it was claret-coloured, mottled from irregular congestion. The kidneys were slightly granular under their capsules, congested, but otherwise normal. He never had albuminuria. When I speak of a successful treatment of this case, it is obvions that I use the word comparatively; it was neither successful as to the ultimate result to the patient himself, nor altogether successful as to the complete diminution of the spleen; but when we find in this case, in the face of a liver so diseased as ultimately to produce a primary and fatal ascites, and which must, therefore, have tended greatly to maintain an enlarged condition of the spleen, that nevertheless that organ was reduced by a few months' treatment to an amount which must have equalled at least one pound, and probably was nearer two, I think I am justified in considering the treatment, under the circumstances, as not only comparatively, but even as highly successful, and as fully bearing out the encomiums pronounced upon it in relation to this disease by Dr Maclean.[1]

Dr Bennett remarked that a case of enlarged spleen successfully treated, and yet terminating in death by dropsy, was certainly open to criticism. The tendency of all such organic enlargements was to diminish imperceptibly, growing gradually harder and more nodulated, causing compression of large veins, and thus producing dropsy, of which the individual died, as in this case. Very many so-called cures were thus not due to the remedies employed, but to the ordinary course of the pathological process. Thus he himself had at one time entertained a strong belief in the efficacy of Valsalva's treatment of aneurism; and in one particular case of aneurism of the mesenteric artery, both he himself, as well as Dr Christison, under whose care the patient had also been, firmly believed that the consolidation of this aneurism, and consequent improvement of the patient's health, had been due to this treatment. The man, however, died suddenly, poisoned accidentally by aconite; and it was then found that the consolidation had been actually due to retardation of the circulation through a large aneurism developed in the aorta above the primary sac. Dr Balfour believed that the diminution of the splenic growth in his case was due to the inunction of biniodide of mercury ointment, but there was no proof of this. The remedy employed was capable of acting as a violent mercurial, and in one case which he (Dr B.) had brought before the Society about a year ago, it had been productive of very serious results in deteriorating the man's health; it was a remedy not free from danger; whether it might also be productive of good was a matter of opinion. Friction as a means of discussing indolent tumours was, no doubt, an appropriate remedy, but he doubted if the addition of any active remedy was beneficial; it could not pass straight through the skin to the affected part, but must act constitutionally, as had indeed been the case in this instance. It was a matter of grave doubt whether mercurial preparations were not rather productive of harm than good in cases of enlarged spleen and liver; and he believed that any change in size thus produced was due rather to natural pathological causes than to any problematical effect of the drug.

Dr Balfour replied, that in detailing this case he had not forgotten the ordinary pathological sequence in organic tumours; indeed it was the recollection of this which had mainly influenced him in bringing this case before the Society. He believed it was contrary to all pathological experience that an enlarged spleen should diminish with a gradually increasing contraction of the liver, a contraction which, in this case, so excessively compromised the portal circulation as to produce a fatal ascites. In such circumstances, enlargement and not diminution of the size of the spleen was the ordinary pathological sequence of events; and the diminution of the spleen in this instance by one or two pounds, notwithstanding this unfavourable complication, he believed to be the strongest possible proof of the efficacy of the remedy employed.

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[1] Reynolds's System of Medicine, vol. i. p. 68.

In regard to the treatment of aneurism, the remarks made by Dr Bennett could not apply to the cases he had exhibited at the last meeting of the Society. In the one case (Rice) the consolidated aneurism was so near the heart that there was no room for the development of a secondary aneurism above it capable of exercising such an influence as that referred to. In the other case (Wilson) the primary abdominal aneurism had been felt to be consolidated for three years before the development of the other one above it. During all that time the hard nodule was to be felt with a comparatively sound (as to calibre at least) aorta above it, and the secondary aneurism was only developed at the end of that period apparently by the unfavourable influences to which the poor man had been exposed in the course of earning his daily bread by manual labour.

IV. *Dr Bennett* then gave his VALEDICTORY ADDRESS, in which he stated, that what had struck him most during his two years' tenure of office, was the many disputed points in practical medicine which only seemed to require an additional expenditure of time and labour in order to settle them once and for ever. With all the modern appliances of chemistry, physiology, and histology, there was hardly any proposition in medicine which could not be fully determined by combined labour, provided money were forthcoming —for time and toil must be paid for; and it was unworthy of a great nation, and cramped the requisite inquiries, to leave to private enterprise what ought to be the duty of the State. After all, much money was not required, the Government cattle-plague inquiry, which had completely settled that question and remunerated the investigators, only cost £800; and a committee in Edinburgh which had solved with equal certainty and satisfaction the question as to the cholagogue action of mercury, without remunerating the inquirers, cost £116. The want of means for prosecuting such inquiries was nowhere so strongly felt as in connexion with our large infirmaries, where no question could, for want of them, be prosecuted to a satisfactory conclusion.

The meetings of this Society had been fraught with much instruction to those who had attended them, and he trusted that they might be stimulated so to work together in the way he had pointed out as ultimately to produce permanent beneficial results. In the meantime every encouragement should be given to individual exertion, which such societies as the Medico-Chirurgical were well calculated to promote.

He did not think it necessary to recapitulate the names of the good and true men they had lost from their number during his tenure of office, because their biographies had been already so fully published by the literary and medical press that he felt that any further allusion to them was quite superfluous.

In regard to the future conduct of the business of this Society, he pointed out that when pathological specimens were shown, advantage was frequently taken of their exhibition to dwell at length on surgical procedures, which, from being brought forward at this period, could not be criticised, and were therefore allowed to pass unchallenged, though many might dissent from the views promulgated. It would be invidious to signalize one offender where all had more or less erred, but he trusted that for the future such a proceeding should not be permitted, and that pathological specimens should only be exhibited as such, all comments on the surgical or other treatment to which they may have given rise being strictly confined to the ordinary communication, when they might be criticised with that fulness and freedom which they deserved. Dr B. also stated, that he thought the funds of the Society could not be better expended than in procuring the services of a reporter, whose services would make the Society's proceedings more full and valuable than they had hitherto been. He concluded by thanking the Society for the honour they had done him, and for the courtesy with which he had been invariably treated by the members.

At the meeting for private business subsequent to the conclusion of the public business, the following gentlemen were elected office-bearers for the ensuing year:—*President*, Dr P. D. Handyside; *Vice-Presidents*, Dr Matthews Duncan, Professor Lister, Dr Robert Paterson; *Councillors*, Dr James Fraser, Dr John Chiene, Dr C. H. Groves, Dr Wyllie, Dr Gordon, Dr John Sibbald, Dr J. R. B. Cunynghame, Dr William Craig; *Treasurer*, Dr George W. Balfour; *Secretaries*, Dr Argyll Robertson, 40 Queen Street; Dr Claud Muirhead, 7 Heriot Row.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXI.—MEETING II.

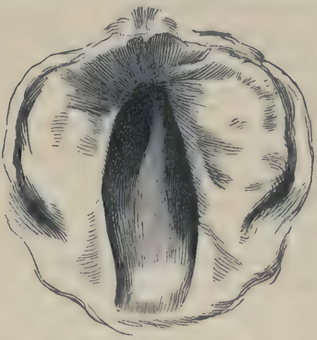
22*d November* 1871.—Dr BELL, *President*, in the Chair, afterwards Dr THOMSON.

THE following Fellows were elected office-bearers for the next two years:—*President*, Dr Ramsay Thomson; *Vice-Presidents*, Professor Simpson and Dr Matthews Duncan; *Treasurer*, Dr James

Young; *Secretaries*, Dr R. Peel Ritchie and Dr Andrew; *Members of Council*, Dr A. Keiller, G. Stevenson Smith, and T. H. Pattison.

Peter A. Young, M.D., Portobello, and Alexander Ferguson, F.R.C.S.E., Peebles, were admitted Fellows of the Society.

I. *Dr James Young* showed a CAST OF A CONGENITAL MALFORMATION OF THE PALATE, which was taken by the late Mr Ayton. In this case the child was born at the full period of utero-gestation, and was in every respect healthy and well developed, with the one exception, namely, entire absence of the hard and soft palate. The child could not suck, and was consequently brought up by spoon-feeding, and throve pretty well. Bronchitis caused the child's death at the age of 2½ months, and the question arises as to whether or not the disease might have been so far superinduced by the congenital deficiency.



Dr Jefferiss said he had recently met with a similar case, where there was no hard palate, but the child did well.

Dr Ritchie remarked that many of these cases die in early life. He remembered one case in the Children's Hospital where there was entire absence of the hard palate.

II. *Dr Keiller* exhibited a FŒTUS which had been expelled prematurely from placental disease. It was the second pregnancy, and he had previously shown a fœtus from the same patient. In the first instance, the placenta was affected by hydatids. There was no history of syphilis.

III. *Dr James Young* then read his paper, entitled,

INTERESTING CASE OF NEPHROCYSTOSIS, FROM AN OBSTETRICAL POINT OF VIEW.

The patient who was the subject of this most painful disease, had a long and weary period of suffering. I had not the opportunity of observing the progress of the disease from its commencement, having only seen the patient during the last two years, but I may be allowed to give a very brief outline of the case, which I have culled from various sources:—

Isabella ——, aged 43, was born in the neighbourhood of Berwick-on-Tweed, and enjoyed very good health for thirty years of her life. Her parents were healthy, the father having lived to 80, and mother to 60 years of age. There were nine children, all healthy and alive. Isabella —— began to complain of pain over the right hypochondriac region 13 years ago, after she had attempted to move or lift a heavy drawing-room chiffonier. Six months thereafter she consulted the late Dr Sibbald, who discovered a small tumour or enlargement below the liver. Four years passed on, the patient only slightly complaining, and early in 1862 she consulted Dr Alexander Simpson, and remained under his care more or less for three years. I am not aware what was the diagnosis, or prognosis, which Dr A. Simpson made out, but I believe he pronounced it to be a growth in the right side, about the size of a large egg, and not likely to be easily, if ever, removed. From 1865, when Dr Simpson left Edinburgh, to 1869, she was under no medical care, not having suffered much inconvenience beyond occasional pain. In August 1869 she consulted me, and, on careful examination, I discovered the existence of a large tumour—possibly, I thought, ovarian—solid, and very elongated, distinctly filling one side of the abdomen. It was movable and painful on pressure. She was not, however, prevented fulfilling her usual duties as a housemaid. In October 1869, we had a consultation with an eminent physician, who looked on the case as a fibroid tumour of the uterus, but recommended no interference of any kind. The tumour continued to increase in size until December 1870, when I asked the same medical man to see her. At this time the size of the tumour was very great, and more painful on pressure. No operation was thought of. Patient became sleepless, and suffered much from constipation. I recommended her to leave her situation, and to take perfect rest. Gentle aperients were ordered, and anodyne applications to the right side. In June 1871, I ordered her to go home to Berwickshire, where her general health somewhat improved. In August last she came to town, when I found the tumour more painful and larger. She now suffered from occasional hiccough. No other tumour had been discovered.

During the first week of October she had several slight attacks of hæmaturia. The urine was plentiful, and free from albumen. Sickness commenced, with frequent vomiting, and on the 15th she had a severe attack of bleeding from the nose. The medical man in the neighbourhood saw her, and ordered an enema, as the bowels were greatly constipated, but without any effect. Medicine was likewise rejected; hiccough became more frequent, and the stomach refused to retain almost any kind of food. I visited her on the 27th day of October, and found the *facies hippocratica* well marked, pulse very feeble and frequent, abdomen much distended and painful, and urine passed involuntarily. I ordered iced champagne and ice to eat, also Liebig's extract in beef-tea with starch per anum; an enema of turpentine and castor-oil was given next day without any effect whatever, and she died on the 31st of October. Having obtained permission for an autopsy, Dr Black and I made a careful examination of the body, with the following results:—

Heart and lungs quite healthy, likewise the stomach, liver, pancreas, and spleen. A large mass filled the whole right side of the abdomen, extending from the margin of the liver to the iliac fossa. We very carefully dissected it out, and found it to be the right kidney, of enormous growth, weighing fully 4 lbs. The tumour, as you will observe, is a pure nephrocystosis, or a cystic tumour of the kidney degenerated. We were naturally anxious to inquire into the condition of the left kidney, and discovered it also to be enlarged from the same disease, weighing 3 lbs., the existence of which had not been observed during life, the patient never having complained of pain in that side. The obstetrical aspect of this most interesting case is my apology for bringing it under your notice. *Per se*, it is not for our Society; but, in an obstetrical point of view, I think you will allow that I am justified in directing your attention to it, for during life the tumour to me assumed the appearance of an ovarian growth, and one far more able to form a correct opinion looked on it as a fibroid tumour of the uterus, proving how difficult it may sometimes be to arrive at correct diagnosis in cases where you have to deal with abdominal tumours. The preparation before you of cystic degeneration of the kidney is a comparatively rare form of renal disease. In this case, you have the tubuli uriniferi largely dilated at their multitudinous terminations. The cysts vary much, from the size you see them here to microscopical dimensions.

Dr Keiller said he had a patient under his care with a tumour of the right kidney, and in the diagnosis it came to be a question whether it might not be ovarian. It had no connexion with the uterus. Sometimes cystic tumours of the kidney in infants are so large as to obstruct labour.

Professor Simpson said that he would very much like to see the internal structure of the tumour Dr Young had shown: cystic disease results from dilatation of the tubules. Sometimes pressure on the ureters causes dilatation of the tubules, and degeneration follows.

Part Fourth.

PERISCOPE.

Physiological and Therapeutical Effects of Antidestructive Alimentation.—Dr Marvand has been publishing an account of those various aliments supposed to prevent waste, and he gives the following conclusions:—Alcohol, tea, *le maté*,[1] and coca, possess incontestable physiological and therapeutical properties; these are, 1*st*, General excitation of the cerebro-spinal system, and consequently of the functions of relative life; 2*d*, A retardation of disassimilation and a diminution of organic heat. Their influence on nutrition may be regarded from two points of view: *a*, as stimulants to the nervous system; *b*, as antidestructives. *A*, Alcohol acts directly on the sensitive apparatus of the spinal cord, indirectly on its motor apparatus. Coca acts directly on the motor apparatus, which it excites after the manner of strychnia. Coffee, tea, and *maté* act principally on the brain. Alcohol and coca are, therefore, to be regarded as drinks which excite to muscular action, while coffee, tea, and *maté* excite to thought. *B*, Besides this, they all act as antidestructives, by preventing waste of the tissues from oxidation, and by diminishing loss by secretion. *C*, Thus, we can explain how they excite to work and wakefulness, how they supplement our other aliments, and moderate our vital combustion: hence their daily increasing consumption, their utility in alimentation, and their importance in hygiène. *D*, The abuse of these aliments has, however, two principal inconveniences—1*st*, By their excitement of the nervous system they may produce fatigue, feebleness, and even inertia of that system; 2*d*, By the obstruction which they present to the process of disassimilation, and the retardation of the phenomena of combustion, transmutation, and decomposition, which are indispensable to the continuance of life, they may cause the arrest, the suspension, or complete suppression of nutrition, and thus produce paralysis, torpor, atony, fatty degeneration, and necro-biosis of the cellular elements involved in the acts of nutrition. Thus, is explained the occurrence of alcoholism, caféism, theism, and cocaism. The therapeutical properties of these substances may be deduced from their physiological properties. They may be employed, 1*st*, As excitants of the nervous system; 2*d*, As anticalorifics; 3*d*, As antidestructives. *B*, Their place in the materia medica is as excitants of relative and depressants of organic life. This latter action is a corollary flowing from the former; because the nerve-centres which preside over the acts of nutrition (assimilation, disassimilation, proliferation, and all the other organic changes, combustions, and decompositions) act with less power the more those centres which preside over the intellectual, sensory, and motor functions develop an excess of energy and activity, and are subject to a more forcible and durable stimulation.—*Gazette des Hôpitaux*, No. 138, 1871.

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[1] Paraguay tea, made from the leaves and twigs of the *Ilex Paraguensis*.

ON THE TREATMENT OF STRANGULATED HERNIA BY THE REMOVAL OF AIR BY SUBCUTANEOUS PUNCTURE.—Some new facts bearing on this subject are to be found in a thesis by Dr Autun.

Professor Duplony of Rochefort applied the suction-syringe to a strangulated hernia in a young soldier in which the taxis had been freely tried without success. He removed a quantity of gas. He intended to introduce a small quantity of water into the tumour, and removed the needle for this purpose, when a surgeon who was present felt the tumour, noticed a gurgling in it, which was immediately followed by the return of the bowels. Dr Duplony was in doubt whether to attribute the return of the bowel to a more full anæsthesia of the patient, or to the amount of air removed, but certainly it is a proof of the harmlessness of the operation, no symptoms having followed the puncture. The following case is from Dr Dugue of Mans :—" I was asked to assist Dr Bourdy at an operation for strangulated hernia in a woman near Mans. It was a right inguinal one of four days' standing. It contained bowel, which was much distended, and contained both air and fluid. Before operating we tried the small suction trocar. The needle being plunged into the intestine, the pump rapidly filled at two separate applications with gas and fluid. The tumour diminishing became soft. We then hoped reduction would be easy; this unfortunately was not the case, so Dr Bourdy proceeded to operate, and, after opening the sac, we found it impossible to discover the needle-hole, nor did a drop of fluid or a bubble of air escape during the operation, or when the bowel was being returned. After the adhesions were divided reduction was easy. Some hours later the bowels were moved by a purgative. Next morning the patient was quite easy. Though the aspiration was here not successful from the amount of adhesions, yet the harmlessness of the puncture is proved.

Again, in Lariboisière, Messrs Desnos and Chalvet had used Mr Dieulafoy's instrument in a puncture of the bowels in a case of hysterical tympanitis. The needle passed into the bowel, and liquid fæces had been drawn into the chamber. The patient had not suffered, nor did any signs of the puncture remain in a few hours.

Again, Mr Autun had made several experiments on rabbits with the same instrument, piercing their intestines in various directions without any bad results.

Another case is reported by Dr Phellippeaux, in the *Bulletin Général de Thérapeutique*, in a paper on various successful applications of the aspirator. In a case of strangulated hernia he made two deep punctures; each produced only a few drops of serum stained with blood. This enabled him to make the diagnosis of an omental hernia, and to postpone operation. No harm followed the punctures.—*Gazette des Hôpitaux*, No. 99, 1871.

ON VASCULAR MURMURS WITHIN THE LUNGS.—Bartels treats of cardiac systolic murmurs heard in the lungs (*Deutsch. Archiv. f. klin. Med.*, 1869, pp. 111–125), and Immermann describes a case of cirrhosis of the lung, with consequent narrowing of both pulmonary arterial trunks and of their primary branches, in which a systolic murmur could be detected in front of the heart and above it, and also in the back. Bartels observed seven analogous cases. One of them resembled that of Immermann; in five other cases there was a partial induration of the lung-tissue by chronic pneumonia. In the seventh case, the murmur existed over one lung that had long been compressed by a pleuritic effusion, but which had discharged through a fistulous opening. The effusion, however, accumulated anew, and as it did so the murmur grew weaker, but became louder again on the evacuation of the fluid. Bartels supposes the murmur to have been generated in this case by the pressure of the indurated upper lobe of the right lung upon a branch of the pulmonary artery, and that the murmur disappeared when the effusion was excessive, but returned when this had partially subsided. He also judged that it could not have arisen in the main trunk of the pulmonary artery, because it was audible only above the third rib. In the remaining five cases, he was of opinion that the murmur originated in a dilatation of the arterial branches, as a similar one is heard in certain cases of vascular goitre. The vascular channel, he supposed, was rapidly contracted by the obstruction of a considerable area of lung-tissue, the mass of the blood not being at the same time proportionately diminished, wherefore the pressure of the blood was increased within the narrowed vessels, which consequently underwent dilatation. Under these circumstances, the murmur became intensified during inspiration, for by that act the current of the blood was quickened and its pressure augmented.

TRAUMATIC TETANUS CURED WITH HYDRATE OF CHLORAL. By Dr J. SUYDAM KNOX.—Mitchel C., aged 17, sent for me 10*th July* 1871. Found him sweating profusely, jaws firmly locked, tonic spasms of all the voluntary muscles, with exacerbations whenever any one approached or addressed him, or the least air blew upon him. Pulse 120; bowels regular; urine high-coloured, and passed frequently; face drawn and anxious. He states that on 12th June, in New York, his right great toe was crushed by a falling cake of ice. 20*th June.*—Experience some stiffness of jaws followed in two days with general cramps in limbs. 25*th June.*—Called a physician, who prescribed medicine which seemed to control cramps and induce sleep. Came to Somerville, N. J., the day I was first called. Judging from his description that hydrate of chloral had been administered, I prescribed it in thirty-grain doses, to be taken every four hours in syr. acaciæ. It was taken easily, as he could swallow whenever the legs were held firmly. Lemonade, beef-tea, and brandy, with milk, were freely administered. The chloral promptly controlled the spasms, and induced sleep. At the end of four days it was administered only night and morning. 20*th July.*—He was discharged cured.—*Amer. Jour. of Sciences*, Oct. 1871.

ON A FORM OF FRACTURE OF THE BONES OF THE FACE, AND ITS DIAGNOSIS. By M. DUBRIEUL.—Certain injuries of the face are followed by anæsthesia of half of the upper lip. Different theories as to the nature of the accident are held. Jarjavay considers it a symptom of fracture of the malar bone; Richet, of the upper jaw bone, and connects the symptoms with a lesion of the infraorbital nerve. I have dissected two cases of destruction of the infraorbital nerve, coincident with the following lesions of the bones of the face. The first died so soon after his injury, without ever passing out of his state of coma, that I was unable to assure myself by experiments that the upper lip was insensible; the other lived for a month and a half, and by many experiments, I proved the complete insensibility of his left upper lip; he did not feel the entrance of a pin into that part usually so sensitive. In his case the infraorbital nerve was completely destroyed at its exit from its canal; in the first, it was divided in the centre of the canal. In both cases there was a marked flattening of the zygomatic arch. In both there was a fracture of the malar bone, above the upper jaw bone, at its outer and upper wall, the internal wall and alveolar margin being left entire. Such accidents are the result of antero-posterior violence, such as a fall on a pointed object, or a severe blow with a fist.—*Gazette des Hôpitaux*, No. 69, 1871.

Compound Syrup of Assafœtida.—Mr J. J. Rambo of New York calls attention (*American Journal of Pharmacy*, September 1871) to a formula for this preparation, which, he says, he has been for a number of years in the habit of preparing, to obviate the great objection felt by most patients to the disagreeable smell and taste of assafœtida, and which has prevented, to a great extent, the more general use of this valuable drug. "The formula I find to answer the purpose effectually, at the same time its medicinal qualities are enhanced by composition with syrup of wild cherry, possessing the valuable therapeutic properties of both. ℞. Infusi pruni Virginianæ Oj.; assafœtidæ ℥j.; sacch. albi ℥xxiv.; magnes. carb. ʒij. Rub the assafœtida and magnesia with the infusion gradually added, so as to make a uniform mixture, and filter; to this, transferred to a bottle, add the sugar, and agitate occasionally until it is dissolved. As a result we have a handsome syrup, which does not differ in appearance from the syrup of wild cherry. The property possessed by the volatile oils of bitter almonds, cherry laurel leaves, bark of wild cherry, etc., containing hydrocyanic acid, of removing the odour of assafœtida, has long been known, and advantage taken of this property by M. Mahair, a French pharmaceutist, to remove the odour from mortars and bottles with which it came in contact; but I am unaware that the fact has ever been applied to its administration as a medicinal agent."

Part Fifth.

MEDICAL NEWS.

CORRESPONDENCE.

(To the Editor of the Edinburgh Medical Journal.)

Sir,—Having during the past summer spent some time at Ben Rhydding, and having had opportunities of judging of the treatment adopted at that famous institution, it has occurred to me that a few reflections on the subject might prove not uninteresting to the profession.—I am, Sir, yours etc., Medicus.

BEN RHYDDING AS A HYGIENIC AND HYDROTHERAPEUTIC ESTABLISHMENT.

There are few of those who take an active part in the busy everyday life of the present century, but feel ever and anon that they must relax their efforts, or, as the ancients tersely put it, *festina lente*, hurry at leisure. This remark applies more especially to brain-workers, and such as trace their ailments to long-continued mental activity—in Britain, unfortunately, a numerous class. There is a point beyond which flesh and blood cannot endure, and some of the hardest heads and stoutest hearts in these realms daily succumb to the prevailing system of overwork. The misery induced is often incalculable. Lives valuable to the possessors, to relatives, friends, the country and posterity, are sacrificed without stint, because we urge ourselves, or are unhappily urged by circumstances, at a speed which cannot possibly last. In our strivings after fame, fortune, position, and the minor vanities of humanity, we forget, or, what is worse, practically ignore, that "the race is not to the swift, nor the battle to the strong."

Sana mens in corpore sano is a very old maxim, the true meaning of which seems to have been forgotten in modern times. The majority of people, in these degenerate days, have a belief (how acquired no one knows) that will, energy, force of character, and the like, can achieve everything possible on this side of the grave. They force their poor bodies and brains to perform work for which they are totally unfit, and, as a consequence, they break up in the process. It is thus that our asylums and watering-places are crowded, and our population decimated. Of late years, particularly since the introduction of railways, telegraphs, and cheap postage, it has been the custom, and we fear the profession has been sadly to blame in this matter, to patch up the system, so as to enable the individual to continue his unnatural exertions until he literally goes to pieces. What more common with authors, city men, contractors, speculators, and hard thinkers as a whole, than the request to be tided over a temporary illness? They tell you plainly they cannot afford to be laid up; but they forget, and the physician who temporizes apparently overlooks the fact, that the aggregate of little ailments not unfrequently begets an illness which lasts a lifetime. The laws of health and not convenience are to be studied. It is vain to suppose that, if a constitution is undermined by systematically ignoring the laws of health for twelve or fifteen years consecutively, it can be set to rights in a week or even a month. Nature never works by leaps. The links in the chain may be missing, but they were there originally; and to restore the structure to its former excellence, the links must be replaced. If time is required to disturb the finely-adjusted mechanism, time is also required to put it in order. If it is true that the body is built up by successive elaborations, it is also true that it may be broken down by successive disintegrations. The two things are diametrically opposed to each other. There is no mistake more common than to imagine that a system, vitiated and partly broken up by overwork, impure air, want of exercise, improper food, etc., can be restored to its pristine vigour by the agency of drugs. This can only be done by a change of all the conditions which caused the patient to diverge from health. To obtain the required change at a moderate cost is often a matter of exceeding difficulty, and it is with a view to directing the attention of the profession to a fitting *sanatorium* that the present notes on Ben Rhydding are published. As a residence, Ben Rhydding is nowhere surpassed in England. Situated high and dry on the sloping banks of Wharfedale, one of the finest valleys in Britain, it commands a prospect of something like 100 square miles. The country around it is altogether pastoral and magnificently wooded. It displays an embroidery of beautiful lanes, which if they can be equalled, certainly cannot be surpassed. Its grounds are something over 100 acres in extent, and as they are contiguous to a common some six miles square, and open up into an infinite variety of most picturesque lanes and bypaths, the visitor is irresistibly tempted to take long rides, drives, or walks. The beautiful river Wharfe, which glides through the valley like a silver snake, holds out additional attractions; for on its banks are situated the venerable ruins of Bolton Abbey and other achitectural remains of exceeding interest. As to the building itself, it is impossible to speak in too high terms. It is a noble pile in the Scotch Baronial style, and more resembles a ducal residence than a temple dedicated to Hygeia. Its public rooms are unusually commodious and elegant, and its sitting-rooms and bedrooms lofty, well-ventilated, and cheerful. An air of "cosy comfort" pervades the whole, and there is no confusion or bustle at any time of the day or night, in any part of the building. A more enjoyable retreat for a month or six weeks cannot be imagined. The bill of fare is likewise excellent. At six or seven o'clock in the morning, according to arrangement, the visitor is treated to a cold or tepid bath as befits his condition. He has then a short walk in the grounds, returns to breakfast at eight; attends prayers, has a look at the morning papers; goes out for an excursion or plays at rackets, billiards, croquet, etc.; returns to dinner at two with a vigorous appetite; goes out again and remains till seven, when tea is served. The food is plain, wholesome, in great variety, and beautifully cooked. This is saying something, for there is, perhaps, no nation under the sun where cooking is less understood than in Britain: with positively the best of everything edible, we make a very poor use of it when compared with our Continental neighbours. Beer and wine (chiefly claret) are indulged in at dinner by those who prefer reserving the water for the outer man. These luxuries, however, are taken in severely moderate doses. At eight o'clock the visitors assemble in the great drawing-room, where music, vocal and instrumental, enliven the shades of evening. Charades and various games are enacted, and the younger members of the community form themselves into quadrille parties, and trip it on the light fantastic toe. There is amusement for all. The grave and reverend seniors have their game at whist, drafts, or backgammon, according to preference; and thus the night passes pleasantly and quickly until ten o'clock, when the lights are lowered, a sign for general dispersion. A few minutes later, and the visitor is either in the arms of Morpheus or hastening thereto. Ben Rhydding, with its regularity, home quiet, airy rooms, substantial fare, and beautiful surroundings, forms a striking contrast to every kind of private inland or seaside lodging.

Fortunate in many things, it is in none more so than in its physician and proprietor, Dr Macleod. To this gentleman's perseverance and acknowledged ability, is to be attributed in a great measure the high position which hydrotherapeutics hold in Britain at the present day. Taking as his basis of operation the most approved facts in physiology and pathology, Dr Macleod endeavours to build up and replace what disease has vitiated and destroyed. This he believes is to be done less by the operation of medicine than by the aid of natural curative agents, which chance has, as it were, placed at his elbow. He however, like other orthodox physicians, has faith in the efficacy of medicines, and administers them whenever he can derive positive advantage from their use. His treatment is therefore hygienic, hydrotherapeutic, and medicinal in its nature. Hydrotherapeutics, in Dr Macleod's opinion, embraces the application of water in various ways, and at various temperatures and degrees of force, to the surface of the body, as well as its internal administration.

"The value of water as a remedial agent," he observes, "has not yet been sufficiently recognised. It contributes more than any other substance to the sustenance of animal life; it makes up 70 per cent. of the weight of the human body, and is as much an integral part of the blood as albumen or fibrine, for it is structurally combined with the other elements. It is the carrier of the food, the vehicle of waste, the cooler of the body, the stimulant of nutrition, and a most important agent in the development of vital force. By an agency peculiar to itself it carries into the blood, to be eliminated by the excretory glands, or to pass into the tissues, the materials which were vital yesterday but effete to-day, and the removal of which leaves the system free to perform its functions."

The Ben Rhydding water, fortunately for Dr Macleod, contains a considerable quantity of potash—a rare circumstance, and one which supplies him with a valuable agent for the successful treatment of gout, rheumatism, and diseases of the kidney. He employs the hydrotherapeutic treatment in functional diseases; in stopping the degeneration of tissues; in restoring nerve power; in removing effete matter from the system; in developing vital force in weakened or exhausted constitutions; and in retarding the too rapid advance of old age, arising from the wear and tear of professional and commercial life. When structures have become diseased, or morbid matters deposited in them; when the organism has been chronically poisoned by constitutional or blood diseases; and when organic matters natural to the system are wanting, he adds to hydrotherapeutics, local, special, and general medicinal treatment.

In Dr Macleod's hands, the local treatment of throat affections has been very successful when combined with the compressed air bath and a tonic course of hydrotherapeutics. He has been equally fortunate in his treatment of hysteria, neuralgia, spinal irritation, incipient paralysis, and torpidity of the uterus. In such cases he combines galvanism with hydrotherapeutics. Dr Macleod's sheet anchors are necessarily and naturally hydropathy, hydrotherapeutics, and hygiene. The latter is little understood in Britain, but we hope the day is not far distant when a chair of hygiene will be founded in every university.

Every form and variety of bath is employed at Ben Rhydding: the rain, plunge, sitz, and pack bath; medicated baths of various orders; the Roman, or hot air bath; the vapour bath; and last, and certainly not least, the compressed air bath. The results obtained from the employment of the several baths indicated are, with the exception of the last, well known to the profession.

The compressed air bath is deserving of special attention, both on account of its novelty and its efficacy in certain diseases. It has been found particularly beneficial in chronic bronchitis, asthma, the first stage of consumption, amenorrhœa, congestion of the liver, and deafness arising from congestion or thickening of the lining membrane of the Eustachian tube. So far as we know, Dr Macleod's is the only compressed air bath in operation in Britain. This peculiar form of bath was originally devised by Emile Tabarié of Paris, and may be briefly described as under:—

"The air bath is a chamber ten feet in diameter and twelve feet high, constructed of iron plates riveted together like those of the boiler of a steam-engine, so as to be perfectly air-tight. It is provided with double close-fitting doors, and four windows, each a foot and a half in diameter, and composed of a single piece of strong plate-glass. The interior is lined with wood, and furnished with seats and a couch for weak patients. The doors are so arranged that in case of need the physician can enter, and patients can leave the bath at any time, without affecting the pressure of air. A seven-horse power steam-engine works, at the rate of fifty strokes per minute, a force-pump seventeen inches in diameter and two feet deep, from which there passes an iron pipe four inches in diameter. This pipe opens into the bottom of a large cylinder, in which are several diaphragms perforated with numerous small holes.

"A pipe, also four inches in diameter, is connected with the top of the cylinder, and after running about 250 yards underground, opens into the air-chamber beneath the floor, which is pierced with a large number of small apertures. By this arrangement a vigorous circulation of air goes on without the patient being conscious of it. A large screw-valve is attached to the entrance pipe, and regulates the passage of air into the bath. From the roof of the chamber an iron pipe, four inches in diameter, is carried down outside the bath into a dry drain, to deaden any noise occasioned by the rapid current of air. This is the exit-pipe, and is furnished with a large screw-valve, by which the amount of air passing off is regulated. While the air is being compressed, and after the maximum pressure is reached, a sufficient quantity of air constantly enters and escapes from the bath, so that the patient never breathes the same air twice. Barometric tubes, placed within the bath, communicate at their upper extremities with the atmosphere outside, while the mercury at the lower end is subjected to the pressure of the air in the interior. The patients are constantly made aware by the indices of the amount of pressure, which is adjusted by the valve in the escape-pipe. An apparatus by which the temperature of the air entering the bath is regulated is also attached. The air forced into the bath is the ordinary atmospheric air drawn from the moors. The duration of each bath is usually two hours. During the first half-hour, the pressure of the atmosphere is gradually raised, at the rate of about one pound to the square inch every four minutes; the maximum pressure of seven pounds and a half is maintained for an hour; and during the last half-hour it is allowed gradually to diminish, until the normal state of the air is regained. The slowness in the increase and diminution of the pressure is of fundamental importance in the use of the air-bath as a curative agent. The patient ought to sit erect in the bath, and to take frequent deep and full inspirations. He ought to keep quiet, and as free as possible from every sort of excitement; and should he feel drowsy, he ought to allow himself to fall asleep.

"In the bath the respiration becomes slower, fuller, and deeper; and less need is felt for continuous breathing than in an atmosphere at the usual pressure. There is at the same time a feeling of comfort in the lungs, and an unusual facility of breathing. These effects arise from the sedative action of the bath—an action which gradually extends over the whole frame, and is often shown in a marked degree in persons suffering from asthma. Each inspiration becomes less laborious, and the incessant demand for air less clamant. This action especially affects the mucous membrane lining the air-passages, and is produced by the increased pressure of the atmosphere, much in the same way that the bougie, through pressure, gradually lessens and often entirely removes the irritation of the urethral mucous membrane. The effect here described is of the first importance in asthma, chronic bronchitis, and phthisis, for the greater number of cases of those diseases are caused by increased irritation of the mucous membrane, and increased excitability of the nerve-fibres ramifying in the lesser bronchial tubes. The increased pressure of the air also diminishes the thickness and tumidity of the submucous tissue of the air-tubes, which is so often present in many of the severer cases of chronic bronchitis, bronchitic asthma, and phthisis. When these improvements take place, the abnormal secretion of mucus and muco-purulent matter gradually diminishes, until at length the lining membrane of the lung becomes for a while almost too dry—a result which may temporarily increase the difficulty of breathing, but which is soon followed by a permanent improvement in that respect.

"Besides these purely mechanical actions, the compressed air bath enables the lung to perform its functions with more energy and completeness than it can do under the usual atmospheric pressure. For, while the air breathed in the compressed-air chamber is composed of the same relative proportions of its component gases, it contains absolutely a greater amount of each of them. An increased quantity of oxygen is thus presented to the blood, and that under circumstances peculiarly favourable to its absorption—namely, the increased pressure of the atmosphere sustained during a lengthened period. This increase of function within the limits of healthy action is of the first importance in the congested state of the lung which accompanies, more or less severely, all chronic affections of that organ; for, however congested an organ may be, it is relieved when the organ is again enabled to perform its functions with full vigour."

The efficacy of all kinds of baths in giving tonicity to the system, and in bracing up relaxed organs, cannot be overestimated. Water, however applied, produces ultimately a soothing effect. If very cold, it communicates a shock to the system; but the shock, if properly applied, is short-lived, and the exhilarating warmth produced, and the fine flow of spirits which supervenes, is enduring. If the water be very warm, a feeling of oppression steals over one; but this too is speedily followed by a gentle perspiration, which wonderfully relieves the system.

He who can endure, without discomfort, the high temperature of the old Roman or modern Turkish bath, and submit himself, *piping hot*, to the cold douche, experiences a luxury which it is impossible to describe. He feels his earthly tabernacle literally swept out; and, if he is of a keen scent, he may even enjoy the peculiar but pleasant aroma of his own purified humanity.

There are few who have experienced the delightful sensations produced by the pack bath who are not rapturous in its praise. To one whose brain is racked, or whose nervous system is shattered, nothing can possibly be more agreeable or soothing. The marked advantages to be derived from wet compresses applied to the abdomen are, moreover, not to be overlooked. They often do for the alimentary canal what an entire druggist's shop could not. To realize the extent of the benefit derived from a regular course of bathing, it is only necessary to bear in mind that the mucous membrane of the entire alimentary canal is a modification and continuation of the external skin of the entire body—the two forming a complete envelope of skin. If, therefore, the outer or natural skin is stimulated by means of the bath, it follows that the mucous membrane of the stomach and intestines is stimulated indirectly. It is thus that bathing assists in curing dyspepsia, and that melancholy brood of symptoms which invariably accompany it. What physician is there who is not occasionally driven to despair by the utterly wretched appearance of his dyspeptic patients? They are timid, nervous, cold creatures, who love the fire as they love life; who abhor water with the horror of a hydrophobic patient; and who shuffle about their rooms, even on bright days, afraid of the shower which is perchance a day or a mile distant. They do the grumbling for the whole British constitution, and yet at heart they are kindly, good people. Genii of the stream, take them away to your fairy haunts and souse them well. They will soon become as enamoured of the water as Narcissus was of his shadow!

There is perhaps nothing that contributes more to enjoyment and longevity than regular bathing. Our climate is a variable one, and to protect ourselves from its sudden onslaughts, we must harden our bodies by a free exposure to water and air. We must go out in all seasons, and avoid as much as possible heated rooms and late hours. The old Romans were, and the modern Gauls are, aware of the immunity to be enjoyed from a free contact with air and water. Was not the "garb of old Gaul" expressly designed for ventilating the outer man? And did not the ancient Greeks and Romans—yea, the more antiquated Egyptians—erect costly baths of marble and other rare stones?

Speaking generally, the four factors in the preservation of health are,—bathing, early hours, regular exercise, and moderate living. The mass of our population, unfortunately for itself, neither bathes, goes to bed early, nor exercises. To make matters worse, it greatly over-eats and over-drinks. The result is in many cases disastrous, and unless some strong movement be inaugurated to correct those abuses, the chances are that the old British lion will lose his fine proportions and the courage for which he is so justly prized. The medical profession has much power in directing the energies of the people into proper channels; and we hope the time has arrived when it will raise its voice for the erection in every town and village, of public baths, gymnasiums, and sanatoriums, as by these perhaps more than by anything else longevity and happiness are to be promoted. Meanwhile, and by way of parting, let us recommend to all whom it may concern, a brief sojourn at the famous Ben Rhydding; an establishment at the head of its class, and one whose resources for effecting rapid and permanent cures, in fitting cases, are in some senses unlimited.

OBITUARY.—We regret to have to record the death of DR JOHN MACKENZIE, of Grantown, Inverness-shire. But yesterday he was one of our most attentive and diligent students, and his short professional career has been spent in the active and successful discharge of most onerous duties. Dr Mackenzie has, for the last twelve months, been House Physician to the City Fever Hospital, Tolbooth Wynd, where his uniform kindness and attention to the patients and success in the treatment of their disease, gained him their affection as well as the approbation of Dr Littlejohn, the physician in charge, and the Sanitary Committee. Up to a fortnight before his death Dr Mackenzie had excellent health; but having then got accidentally wet, the slight catarrhal irritation paved the way for the reception of the fatal poison which speedily evolved its ordinary symptoms, and terminated in death by convulsions, on the 13th ult. Another name has thus been added to the long list of medical heroes, and another victim has fallen on the shrine of preventible diseases; but though the profession may well be proud of the undaunted heroism of its members, who are always found willing to die, if need be, at their post, it does add poignancy to its regret for the loss of a promising member, to think that a more searching inquiry into the causes of such diseases, and a more active system of sanitation might certainly diminish, if it did not altogether prevent, much of this loss of young and useful lives which is unavoidable under present circumstances.

THE PRINCE OF WALES.—Since our last issue the heir to the throne of Britain has been at death's door from an attack of severe enteric fever. We are glad to think that, though not yet out of all danger, he has so far recovered as to give the strongest reason to hope that his useful life will now be spared, though complete convalescence may be expected to be tardy. The anxious and tender solicitude with which the Prince's illness has been watched throughout the kingdom, and indeed the world, by men of every creed and every nationality, affords a convincing proof of the loyalty of our nation, and of the love and respect with which our Royal Family are regarded throughout the world, a large portion of which is due to the personal virtues of our reigning Sovereign and of her late lamented consort, Albert the Good; while the self-sacrificing attention to the royal sufferer, displayed by his own immediate relatives, has tended still more to enlist the sympathies of their fellow-men. We rejoice to think that the immediate care of his Royal Highness was confided to Sir William Jenner, than whom there is no one better versed in all the phases of the insidious and serious disorder under which he labours; and we trust that the dread anxiety under which we have all laboured may give an additional impulse to the inquiry how such diseases may best be prevented.

SMALLPOX.—For some time past Edinburgh has been bombarded from the insecure distance of Leith and Dalkeith by this fell disorder. Instead of drawing a *cordon sanitaire* round the infected districts, and isolating the patients there as best might be, they have been admitted to our Infirmary and to another temporary hospital in the heart of our city. Amidst our floating population there are at all times a great number of unvaccinated, and a still greater number who, though vaccinated, are susceptible of the disease—for vaccination, though it greatly modifies, can never wholly prevent smallpox; and the result has been an outbreak of smallpox, which, though not by any means excessive, is yet sufficiently alarming; the deaths from smallpox in Edinburgh during November last having amounted to 31, or 6·3 per cent. of the deaths from all causes. Quite recently the authorities have obtained permission to use George Watson's Hospital, which is to form part of our new Infirmary, as a smallpox hospital; and there are at present within its precincts upwards of 130 cases, besides 30 still remaining in the Royal Infirmary. This building stands within its own grounds, is therefore completely isolated, and, as it contains ample accommodation for a much larger number of patients, we trust that an instant removal to it of all such patients will be followed by an abatement of the epidemic.

SIAMESE TWINS.—We take the following from the *Druggists' Circular*:—"The Siamese twins are among the most remarkable twins the world has latterly known. In the year 1100, Eliza and Mary Chalhurst were born in Kent, England, united twins. They lived in this condition thirty-four years, and then one died. It was proposed to cut them apart; but the survivor would not consent, and she was dead six hours after her partner. Two girls were born, fastened together, in Edinburgh, many years ago. The food one ate nourished the other; but often when one slept the other would be 'wide awake.' They lived seven years. In 1700, Helen and Judith were born at Presburg, Hungary, united back to back. They lived twenty-three years. Judith was always feeble, Helen always well and strong; yet they both died at the same moment. In 1856, two children were born united as Helen and Judith were. They are said to be living in Texas at this moment. They are entirely different in disposition and temperaments, and often have bitter quarrels. Lazarus and John Collorado, born at Genoa in 1617, lived many years. The attached and imperfectly-developed twin John hung *with his head downwards* from the lower part of the chest of Lazarus. This double monster married and had several children, who were perfectly and admirably developed. They all visited Scotland in 1642. At the court of James III. of Scotland there lived a man double above the waist and single below it. The two heads learned several languages, and often debated together. The two halves also often engaged in angry fisticuffs. This monster lived twenty-eight years. One of the bodies died several days before the other. Dr Boehm, a celebrated German surgeon, recently cut asunder two female children, aged five years, who were joined like the Siamese twins. One of the girls died on the day of the operation. The other was, at last accounts, alive, and in the best of health."

Royal College of Physicians.—The following office-bearers were elected at the annual meeting on St Andrew's day:—

President.—R. Paterson.

Council.—Robert B. Malcolm, Alexander Wood, A. H. Douglas, W. H. Lowe, J. Matthews Duncan, William R. Sanders.

Vice-President.—A. H. Douglas.

Examiners.—Charles Bell, Alexander Wood, A. Halliday Douglas, Robert Paterson, Thomas S. Wright, A. Keiller, T. H. Pattison, W. Cumming, J. Matthews Duncan, D. R. Haldane, G. W. Balfour, T. G. Stewart, J. Struthers, R. P. Ritchie, J. Linton, C. Muirhead, A. Macdonald, T. R. Fraser.

Treasurer.—Samuel Somerville.

Secretary.—D. R. Haldane.

Librarian.—W. Cumming.

Curator of Museum.—T. R. Fraser.

Registrar of Applicants for License.—D. R. Haldane.

Royal Medical Society of Edinburgh.—The following gentlemen have been elected office-bearers of this Society for the Session 1871–72 :—*Presidents.*—E. Willis Way, M.B.; Lewis Shapter, B.A. Cantab.; H. C. Martin M.B.; A. J. M. Bentley, M.B. *Hon. Secretaries.*—J. Burnley Walker; H. M. Church, B.Sc. *Curator of Library.*—A. C. E. Harris. *Curator of Museum.*—J. E. Shaw.

It is proposed to issue quarterly, to subscribers only, a series of coloured photographs of skin diseases, with letterpress descriptions.

The subscription is to be one guinea annually, and the subscription-list is restricted to medical practitioners, registered medical students, medical book-clubs, charities, and societies. The photographs are to consist not of typical cases, but of such as are interesting from their infrequency or from some abnormality in their course: thus they will supplement and not merely repeat the illustrations of other similar works. The profits, if any, are to be devoted to the general purposes of the British Hospital for Diseases of the Skin, Great Marlborough Street, London, from whose patients the cases for illustration will be selected.

WE have received the following medical declaration respecting Alcohol:—As it is believed that the inconsiderate prescription of large quantities of alcoholic liquids by medical men for their patients has given rise, in many instances, to the formation of intemperate habits, the undersigned, while unable to abandon the use of alcohol in the treatment of certain cases of disease, are yet of opinion that no medical practitioner should prescribe it without a sense of grave responsibility. They believe that alcohol, in whatever form, should be prescribed with as much care as any powerful drug, and that the directions for its use should be so framed as not to be interpreted as a sanction for excess, or necessarily for the continuance of its use when the occasion is past. They are also of opinion that many people immensely exaggerate the value of alcohol as an article of diet, and since no class of men see so much of its ill effects, and possess such power to restrain its abuse, as members of their own profession, they hold that every medical practitioner is bound to exert his utmost influence to inculcate habits of great moderation in the use of alcoholic liquids. Being also firmly convinced that the great amount of drinking of alcoholic liquors among the working classes of this country is one of the greatest evils of the day, destroying, more than anything else, the health, happiness, and welfare of those classes, and neutralizing, to a large extent, the great industrial prosperity which Providence has placed within the reach of this nation, the undersigned would gladly support any wise legislation which would tend to restrict, within proper limits, the use of alcoholic beverages, and gradually introduce habits of temperance. Signed by Dr Burrows, President of the Royal College of Physicians; Mr Busk, President of the Royal College of Surgeons; Dr Paget, President of the General Council of Medical Education; and 251 of the most distinguished medical men of London and the provinces. We cordially concur with all the statements of this declaration, except the first; for we believe that, in Scotland at least, at no period during the last forty years has alcohol in all its various forms been more sparingly and considerately employed in all classes of disease than it now is. At the same time we appreciate the appropriateness of such a declaration emanating from London, where the precepts of the late Dr Todd gave so decided an impulse to the indiscriminate and inconsiderate employment of alcohol in the diseases of all classes.

THE COSTLINESS OF PREVENTIBLE DISEASES.—Some idea of the cost to the country of preventible disease may be gathered from a calculation in the *Times* of 12th Dec. of the actual cost of enteric (typhoid) fever during the last ten years, since the death of the Prince Consort. The data assumed are, on an average annual mortality of 20,000, a mortality of 1 in 6, a value of £100 for each life lost, and a cost of £12 per case in loss of labour and expense of maintenance. These data are manifestly conjectural, but they have a known basis of reality sufficient to entitle them to consideration as a rough measure, probably under the mark, of the extent of an evil we have hitherto tamely endured. And upon them is founded the calculation that, during the last ten years, the loss to the country from the unchecked spread of enteric fever has been not less than £34,000,000 sterling, or an average of upwards of three millions of pounds sterling per annum, besides an additional sum for interest. Surely, as Dr Acland has said, no measure could more redound to the glory of a government than one which would render such expensive and "senseless accidents" impossible alike in the houses of rich and poor. And the *Times* has made this practical suggestion, that every case of enteric fever should lead to a judicial inquiry into its causes, and any person or corporation found responsible by any act or default for its production should be liable in pecuniary damages to the sufferer or his representatives. There can be little doubt that some such enactment would at once lead to such watchfulness over architects, builders, and plumbers, as would speedily produce a marked sanitary reform. And we see no reason why railway companies should be amerced in heavy damages for accidents from defective material, while architects get off scot free for so-called accidents more harassing and painful in their nature, more expensive to the country, and no more to be regarded as "dispensations of Providence" than deaths following running a train with a cracked axle in its midst.

SURGEON-MAJOR FASSON, late of the Herbert Hospital, Woolwich, has been elected Superintendant of the Edinburgh Royal Infirmary.

PUBLICATIONS RECEIVED.

Dr Henry Adams,—Intermittent Malaise. London, 1871.
T. C. Allbutt, M.D.,—On the Use of the Ophthalmoscope. London, 1871.
William Allingham, F.R.C.S.,—Diseases of the Rectum. London, 1871.
Francis E. Anstie, M.D.,—Neuralgia. London, 1871.
William Henry Archer,—Index to Abstracts of Patents and Patentees in Victoria for 1869. Melbourne, 1871.

Lombe Atthill, M.D.,—Clinical Lectures on Diseases of Women. Dublin, 1871.

James Henry Bennet, M.D.,—On the Treatment of Pulmonary Consumption. London, 1871.

James L. Bryden, M.D.,—Vital Statistics of the Bengal Presidency, 1858 to 1869. Calcutta, 1871.

Dr Ezio Castoldi,—Sull' Alcoolismo Acuto. Milan, 1871.

Dr W. Chasseaud,—Mode d'Invasion et de Propagation du Choléra. Constantinople, 1871.

W. Cholmeley, M.D.,—Annual Oration delivered before the Medical Society of London. London, 1871.

W. R. Cornish, F.R.C.S.,—Cholera in Southern India in 1870. Madras, 1871.

William Curran,—Medical History of the Himalayas. Dublin, 1871.

Ephraim Cutter, M.D.,—Treatment of the Versions and Flexions of the Unimpregnated Uterus. Boston, 1871.

Dr H. Dagonet, — Des Impulsions dans la Folie, et de la Folie Impulsive. Paris, 1870.

Arthur Scott Donkin, M.D., — Skim-Milk Treatment of Diabetes and Bright's Disease. London, 1871.

J. Matthews Duncan, M.D.,—Fecundity, Fertility, and Sterility, 2d edition. Edinburgh, 1871.

Edward A. Fitzgerald,—Epidemic Cholera. London, 1871.

J. Milner Fothergill, M.D.,—Digitalis, its Mode of Action and Use. London, 1871.

Dr F. Frédault,—Histoire de la Médecine. Paris, 1870.

Joseph Gamgee,—A Treatise on Horse-Shoeing and Lameness. London, 1871.

Sampson Gamgee,—On the Treatment of Fractures of the Limbs. London, 1871.

Wilson Fox, M.D.,—The Treatment of Hyperpyrexia. London, 1871.

Frederick James Gant, F.R.C.S., — The Science and Practice of Surgery. London, 1871.

T. Henry Green, M.D.,—Introduction to Pathology and Morbid Anatomy. London, 1871.

Furneaux Jordan, F.R.C.S.,—On Clinical Education. London, 1871.

Charles Kidd, M.D.,—Hydrate of Chloral and Nitrous Oxide Gas as Anesthetics. Dublin, 1870.

Robert Liveing, M.D.,—Notes on the Treatment of Skin Diseases. London, 1871.

Liverpool Medical and Surgical Reports. London, 1871.

Z. C. McElroy, M.D.,—The Clinical Thermometer. New York, 1871.

Henry R. Madden, M.D.,—On the Relation of Therapeutics to Modern Physiology. London, 1871.

William Marsden, M.D.,—Asiatic Cholera. London, 1871.

Henry A. Nicholson, M.D.,—Manual of Zoology, 2d edition. Edinburgh, 1871.

Florence Nightingale,—Introductory Notes on Lying-in Institutions. London, 1871.

Hariette Noel-Thatcher,—The Fascinator: A Prize Essay on the Use of Tobacco. London, 1871.

Nouveau Dictionnaire de Médecine et de Chirurgie Pratiques, vols. xiii., xiv. Paris, 1870–71.

William Miller Ord, M.B.,—Notes on Comparative Anatomy. London, 1871.

Drs Parkes and Sanderson,—Reports on the Sanitary Condition of Liverpool. Liverpool, 1871.

Alfred Pullar, M.D.,—Neumann's Text-Book of Skin Diseases. London, 1871.

Recueil des Travaux de la Société Médicale d'Observation de Paris. Paris, 1868–70.

Report on Spiritualism of the London Dialectical Society's Committee. London, 1871.

J. Russell Reynolds, M.D.,—Lectures on the Clinical Uses of Electricity. London, 1871.

Sydney Ringer, M.D.,—Handbook of Therapeutics. London, 1871.

A. Ruppaner, M.D.,—Contributions to Practical Laryngoscopy. New York, 1871.

Golaub Sing, M.D.,—Hindu View of Cholera. London, 1871.

Sir James Y. Simpson, Bart.,—Anæsthesia, Hospitalism, etc.,—Edinburgh, 1871.

David Smith, M.D.,—Preservation of Sight. London, 1871.

T. Grainger Stewart, M.D.,—Bright's Diseases of the Kidneys. Edinburgh, 1871.

Transactions of the American Otological Society, 1871. Boston, 1871.

Transactions of the Clinical Society of London. London, 1871.

Transactions of the Pathological Society of London, vol. 22. London, 1871.

Transactions of the St Andrews Medical Graduates' Association, 1870. London, 1871.

A. Trousseau,—Lectures on Clinical Medicine, vol. iv. London, 1871.

Sir Thomas Watson, Bart., M.D.,—Lectures on the Principles and Practice of Physic. London, 1871.

C. J. B. Williams, M.D., and C. T. Williams, M.D., — Pulmonary Consumption. London, 1871.

Chauncey Wright,—Darwinism. London, 1871.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Some of the Medico-Legal Relations of Insanity to Will-making.* By ARTHUR MITCHELL, M.D., F.R.S.E., Commissioner in Lunacy for Scotland, etc.

THE medico-legal relations of insanity to will-making form the subject of this paper. It will assist me if I introduce the subject by endeavouring very briefly to show who the insane are *legally.*

In a certain sense, every person who is detained in an asylum may be said to be legally insane. For the purposes of the Lunacy Acts, the law declares a lunatic to be *a person certified to be a lunatic by two medical men.* On these certificates the sheriff grants his order or warrant to receive the person into an asylum, and to detain him there as a lunatic. The sheriff is not required to sit in judgment on the sufficiency of the facts on which the certificates rest. If there is no error in their form, he may grant his order as a matter of course. In actual practice he generally does this.

When, therefore, the law is asked to declare a man insane for the purpose of providing for his care and treatment, it does so on moderate evidence of insanity, though the step does involve a loss of liberty—the *sequestration*, if not the *incarceration*, of the patient. The law professes to guard with jealousy the personal liberty of the subject, but in the case of a lunatic it has been thought right not to surround his reception into an asylum with too many legal difficulties, because the step is understood to be taken alike for his own benefit, and the convenience or safety of society.

It thus appears that to get a man declared legally insane, for the purposes of care and treatment, is not a very cumbrous or difficult procedure.

Nor does the law always insist on very weighty and conclusive evidence of insanity, when the result and object of declaring a man insane is to confer on him civil disability. For instance, there is seldom great difficulty in obtaining the appointment of a *curator bonis.*

When we reach crime, however, and when freedom from responsibility results from declaring a man legally insane, the law is decidedly more difficult to satisfy.

To take away a man's personal freedom in order to provide for his care and treatment; to deprive him of the management of his property; to upset his last will and testament,—though certainly important things, are not of such importance, in the eye of the law, as to hold a man irresponsible for criminal acts. Consequently a clearer and fuller evidence of insanity is required to establish this freedom from responsibility.

Each of these results is based on the *existence* of insanity, but for each of them *a different degree or kind of insanity* is required.

The law says:—" Your reason is too much impaired or deranged to manage your property; you are unable to distinguish between those measures which would conduce to your profit and such as would lead to your ruin; you are insane in short, and therefore the law will take the control of your property and the disposal of your person. But if, under the same insane state of mind which renders this proper, you are led to kill your neighbour, it is quite possible that you may be assumed to have acted under the guidance of sound reason; and it may be found that such a state of mind, as properly and legally deprives you of your personal freedom, and of the management of your affairs, does not discharge you from responsibility for the death of a neighbour at your hands."[1]

In other words—and this is what I wish to bring out—the law requires different insanities, or different degrees of insanity, according to the importance or nature of the issues which would follow the declaration of insanity. Even in criminal cases, the plea of insanity is practically accepted more readily, when a crime against property is being dealt with, than when it is a crime against the person.

All through the law, in fact, there is reference made to the degree of mental disease—deeper signs of disease being required in some circumstances than are required in others. This was openly embodied in the verdict of the jury, in *ex parte* Cranmer, which ran thus:—" *So far* debilitated in his mind, *as to be* incapable of the management of his affairs." It was with reference to this verdict that Erskine asked—" How am I to tell what is *so far* debilitated in his mind that he is not equal to the management of his affairs?" But this is just what the law practically, though often unconsciously, affects to tell in questions which relate to the declaration of insanity. It declares that a man may be *so far insane* as to justify his detention in an asylum, or *so far insane* as to require a *curator bonis*, or *so far insane* as to make void his will, or *so far insane* as to free him from responsibility. I believe that every one who has studied the numerous decisions in cases in which the question of insanity has been raised, will have seen that there is throughout them, taken as a whole, the recognition of the need of a small, a great, and a greater insanity, according to the nature of the results which are to follow its declaration.

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[1] Rae.

A woman, for instance, whose mental state is really one of imbecility, is quite easily certified to be a lunatic, and placed under legal warrant in an asylum. Being a lunatic, the law holds in a general way that she cannot give consent, and that connexion with her would therefore be rape. But, when the connexion occurs, and her mental state is more carefully looked into, there is every probability that it will then be found that she is not *so far* debilitated in mind, as to be unable to give consent *in such a matter*, and that no crime has been committed, if she has offered no resistance, which under ordinary excitements and temptations such a patient is not likely to have done. She cannot leave the asylum though she may wish to do so; in the matter of staying or going she has lost her rights of consent, though she can still legally consent to sexual intercourse when she has the inclination and opportunity.

I ask now—Is this an altogether unreasonable view which is taken by the law? Is there not some principle of justice and common sense underlying it? Are there not in fact different kinds and degrees of mental disorder? Is it not as much a medical as a legal opinion, that insanity under every circumstance ought not to annul a person's criminal or civil liabilities?

I do not stop to inquire whether it be a logical conclusion from this that insanity may be pled as a ground for mitigation of punishment, quite as correctly as for total irresponsibility, but I pass at once to the consideration of the question which more immediately concerns us,—What are the particular degrees and forms of insanity which render a man's will invalid? What, in other words, are the legal relations of insanity to will-making?

I shall first, however, lay before you the principles on which a man is held to have a right to regulate the disposal of his property after his death, because it is clear that the nature of this right must influence us when, for any reason, we are asked to disregard it. In other words, it may be a right which we disregard with ease or with difficulty. I do not think that I can disclose these principles more briefly or clearly, than in the words used by Chief Justice Cockburn in his decision of the case Banks *v.* Goodfellow. "The law of every civilized people," he says, "concedes to the owner of property the right of determining by his last will, either in whole or in part, to whom the effects which he leaves behind him shall pass. Yet it is clear that, though the law leaves to the owner of property absolute freedom in this ultimate disposition of that of which he is thus enabled to dispose, a moral responsibility of no ordinary importance attaches to the exercise of the right thus given. The instincts and affections of mankind, in the vast majority of instances, will lead men to make provision for those who are the nearest to them in kindred, and who in life have been the objects of their affection. Independently of any law, a man, on the point of leaving the world, would *naturally* distribute among his children or nearest relatives the property which he possessed. The same motives will influence him in the exercise of the right which the law secures to him. Hence arises a reasonable and well-warranted expectation, on the part of a man's kindred surviving him, that on his death his effects shall become theirs instead of being given to strangers. To disappoint the expectation thus created, and to disregard the claims of kindred to the inheritance, is to shock the common sentiment of mankind, and to violate what all men concur in deeming an obligation of the moral law. It cannot be supposed that, in giving the power of testamentary disposition, the law has been framed in disregard of these considerations. On the contrary, had they stood alone, it is probable that the power of testamentary disposition would have been withheld, and that the disposition of property after the owner's death would have been uniformly regulated by the law itself. But there are other considerations which turn the scale in favour of the testamentary power. Among those who, as a man's nearest relatives, would be entitled to share the fortune he leaves behind, some may be better provided for than others; some may be more deserving than others; some, from age, sex, or physical infirmity, may stand in greater need of assistance. Friendship and tried attachment, or faithful service, may have claims that ought not to be disregarded. In the power of rewarding dutiful and meritorious conduct, paternal authority finds a useful auxiliary; and age secures the respect and attention which are one of its chief consolations. As was truly said by Kent C. in *Van Alst.* v. *Hunter*, 5 Johnson N. Y. Chan. Rep. 159, 'It is one of the painful consequences of extreme old age that it ceases to excite interest, and is apt to be left solitary and neglected. The control, which the law still gives to a man over the disposal of his property, is one of the most efficient means which he has in protracted life to command the attention due to his infirmities.' For these reasons the power of disposing of property in anticipation of death has ever been regarded as one of the most valuable of the rights incidental to property, and there can be no doubt that it operates as a useful incentive to industry in the acquisition of wealth, and to thrift and frugality in the enjoyment of it. The law of every country has, therefore, conceded to the owner of property the right of disposing by will either of the whole, or, at all events, of a portion of that which he possesses. The Roman law, and that of the Continental nations which have followed it, have secured to the relatives of a deceased person, in the ascending and descending line, a fixed portion of the inheritance. The English law leaves everything to the unfettered discretion of the testator, on the principle that, though in some instances caprice, or passion, or the power of new ties, or artful contrivance, or sinister influence, may lead to the neglect of claims that ought to be attended to; yet the instincts, affections, and common sentiments of mankind may be safely trusted to secure on the whole a better disposition of the property of the dead, and one more accurately adjusted to the requirements of each particular case, than could be obtained through a distribution prescribed by the stereotyped and inflexible rules of a general law."[1]

This I think may be accepted as the correct embodiment of the views by which the law of England is guided in conferring the testamentary power.

The law of Scotland rests on the same principle, though in it the restrictions placed on the testator's powers are more numerous and more comprehensive—wives and children having claims which cannot be overlooked, and which rank as debts due by the estate of the dead husband or father.

It is not necessary to point out the differences in the restrictions which have been placed by different laws on the testator's powers, because the law, in securing those powers, whatever their measure be, has been guided by the same principles. The legal claims on the owners of property during their lifetime may differ in different countries, yet the rights of ownership may remain in their essence the same. So the restrictions on the testamentary power may vary; and yet, so far as it extends, it may nevertheless be founded on the same principles.

The law *might* have given no such power. It might have enacted that, after a man's death, his whole property shall always be disposed of in certain fixed ways, without regard to any wishes he entertained during his life. It does this, in fact, if he has not left an expression of those wishes in a certain way. It goes even further, and puts restraints on his disposing power in certain directions and under certain circumstances. But in a general sense it leaves a man free to make arrangements for the disposal of a part or the whole of his property after death; and it gives this testamentary power, because it is believed that, *on the whole*, a more just disposal of the property will be attained in this way, than by any stereotyped distribution which could be invented and prescribed by law. It proceeds on a knowledge of human nature, and thinks that in this matter it may, as the rule, be properly trusted; that the obligations of consanguinity and the ties of affection will assert themselves; that it is not undesirable that there should be a power both of acknowledging kindnesses, and of abstaining from the reward of neglect; that this proves a stimulus to the acquisition of property, and in that way to thrift and orderly living; and, lastly, that it tends to secure for old age that kindness and care of which it often stands in need. Human nature, in this view of it, is credited with low as well as with high motives; and perhaps prudently and properly so, in a calculation of the average product of average character. But *all* the considerations which have given shape to the law in this matter are not related to selfishness. Most of them, indeed, acknowledge in man's nature the existence of something which gives nobility to it; and it is felt that it will, in the main, be for the good of society that this should be allowed to operate without burdensome restrictions; and that the wishes a man has expressed in life, with regard to the disposal of his property after death, should, if possible, be carried into effect. There is indeed a sort of sacredness about such wishes, and a feeling that trifles should not prevent their being implemented. This feeling extends to the law; and, accordingly, the upsetting of a will usually gives trouble. In short, the right of a man to dictate the disposal of his property after death, is one which the law holds in respect, as being based on something deeper than mere law.

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[1] Banks *v.* Goodfellow. Judgment of Chief Justice Cockburn (Blackburn, Mellor, and Hannen, JJ., concurring), Law Times of 13th Aug. 1870.

It is of importance to understand this, and not to lose sight of it in discussing those things which do, or which should annul this right—a right which we have seen to be rather secured than conferred by the law. It is this attitude of the law with regard to it, which explains why a will cannot be broken on frivolous pretences—why, on the contrary, the grounds on which it can be upset must be clear and sufficient.

Now, one of the grounds on which a testament may be declared void, is the *insanity* of the testator; and it is with this ground alone that we have to do. If reference is made to any others, it will only be in the way of illustration.

"It is obvious," as Sir Alexander Cockburn says, "that to the due exercise of a power involving a moral responsibility thus grave, the possession of the intellectual and moral faculties common to our nature should be insisted on as an indispensable condition."[1]

But what are the moral and intellectual faculties common to our nature?

I think it was Sir John Nicholl who said that the rule of law in this matter was the rule of common sense; and, as evidence of this, that competency of mind was to be judged of by the nature of the act to be done, and from a consideration of all the circumstances of the case. This of course implies that minds may be competent to do some things, and not competent to do others.

And we have thus a relational sanity, so that the same man may be both sane and not sane—competent for one act, and incompetent for another. In point of fact, many of the best decisions really rest on this view.

On the other hand, many attempts have been made to define with precision the nature of this competency, and to show exactly in what it consists. For instance, it is said to be, "*judgment to dis-*

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[1] Banks *v.* Goodfellow.

cern with perfect memory,"[1] or "*a disposing memory so as to be able to make a disposition with understanding and reason.*"[2] Of course when we say that a man has "*a sound disposing memory and understanding,*" we have named the kind of memory and understanding which gives competency to make a will; but we have simply given it a name, and have not told what sort of memory and understanding this *disposing* sort is. As often happens when we are dealing with mental phenomena, we get over a difficulty by the help of words, and persuade ourselves that we have said something precise and useful, and have given information, when we have really done nothing but hide the difficulty in a bunch of letters. A *disposing* memory and understanding does not describe any condition of mind, till we have defined the meaning of the adjective *disposing*, which would be an extremely difficult thing to do satisfactorily. It would be impossible to give a definition which would not limp somewhere. The fact is, it is quite as difficult a task to define sanity as to define insanity. The one passes into the other by every conceivable degree. The sane are not separated from the insane by a line, but by a territory. And the thousands who people that territory are in the uncomfortable position of neutrals. According to circumstances they are thought to be leaning to one side or to the other—to sanity or to insanity. Out of this territory comes all our trouble in courts of law—both in questions of irresponsibility for crime, and of civil disability. About those fairly beyond the territory, on either side, there are no disputings. But with reference to the rest, our definitions of sanity and insanity must be now inclusive and now exclusive, in order to satisfy what we believe to be either justice or public convenience. There can be nothing more vexing than definitions which thus fluctuate according to circumstances.

It would be a mistake, however, to suppose that either lawyers or doctors originate this fluctuation. It is the necessary product of the actual state of the case. In other words, it has a real existence. For an oscillating class we cannot help having oscillating definitions; and medical men should remember this when they feel tempted to say hard things of some learned pleadings or judicial deliverances; while lawyers, in their turn, should remember it also, when the opinions of medical men are thought to look like crotchets.

Attempts have been made, however, to get over the difficulty of giving a meaning to the word *disposing*, when so used. I shall give one—that of the Court in the case of Banks *versus* Goodfellow, in many respects the most important decision which has recently, or perhaps has ever been given in a dispute as to the validity of a will on the ground of the testator's insanity. It is valuable for many reasons, and among others because it attempts an answer to the question, What are the intellectual and moral qualities common to our nature, which must be possessed by every testator? According to that decision, "It is essential to the exercise of the power (of willing away property), that the testator shall understand the nature of the act and its effects; shall understand the extent of the property of which he is disposing; shall be able to comprehend and appreciate the claims to which he ought to give effect; and, with a view to the latter object, that no disorder of the mind shall poison his affections or prevent the exercise of his natural faculties, that no insane delusion shall influence his will in disposing of his property, and bring about a disposal of it which would not have been made otherwise."[1]

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[1] Shelford, Law of Lunacy, p. 274.

[2] Shelford, op. cit., p. 275.

It is added, "We have here the measure of the degree of mental power which should be insisted on."

Now, this *measure of a degree* amounts to this:—The testator must understand what he is about; what property he has to leave, and what persons have claims on him. But this mark of sanity is not enough. He must not only be to this extent sane, but he must also not be insane in certain directions. He must not, for instance, be the subject of such an insanity as would prevent the free exercise of his affections, or of an insanity with such a delusion as would have an influence on him in the matter of his testament.

"If the human instincts," the Chief Justice goes on to argue in his decision,—"if the human instincts and affections or the moral sense be perverted by mental disease; if insane suspicion or aversion take the place of natural affection; if reason and judgment be lost, and the mind become a prey to insane delusions calculated to interfere with and disturb its functions, and to lead to a testamentary disposition due only to its baneful influence,—in such a case it is obvious that the condition of testamentary power fails, and that a will made under such circumstances ought not to stand."[2]

So much for what the law regards as mental *competency* in a testator. In consists in the possession of something and the absence of something—the possession of certain signs of sanity, and the absence of certain signs of insanity.

Before discussing the mental states which lead to *incompetency*, I must be allowed to make one short digression.

I am desirous to point out that in all medico-legal questions, but especially I think in those which relate to wills, we deal with the signs or symptoms of insanity rather than with mental diseases. Thus, *what a delusion relates to*, may, in the settlement of the question, be practically of more importance than the mere existence of a delusion. It may also be of importance to show in what parts of the mind the signs of disease are apparent, and how conduct might thus be affected. Even of a general paralytic, the mental phenomena—the mental sign of the disease—must be detailed.

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[1] Banks *v.* Goodfellow.

[2] Ibid.

It will not be enough to say that he was a general paralytic. Indeed, it is because of its signs or symptoms that insanity *is* a disease which so often appears in courts of law, and the signs are there dealt with as the disease.

I proceed now to speak of those mental states which render a man legally incompetent to make a will.

In a general sense, then, all insane persons are incompetent, and the existence of mental disease in this general sense involves the loss of testamentary capacity. When the mental faculties are *deeply* and *widely* involved in disorder, there is an inability to act rationally. Persons so affected cannot form and cannot express wishes, regarding the disposal of their property, which are entitled to attention. They have not a correct knowledge of what their property is; they do not know who those persons are whose claims should be weighed; and they are incapable of deliberation. These persons labour under a *general* insanity of the mind; and if disputings ever arise about such cases they are generally settled without difficulty. The facts being proved, all are agreed as to what should be their effect.

It would serve no good purpose, therefore, to occupy time by a description of these states of mind, which clearly, and by common consent, involve a loss of testamentary rights.

There are, however, other states of mental insanity about which differences of opinion may and do exist. That is, it is not certain whether they should or should not cause a loss of the testamentary power. In these states the signs of mental disorder seem either to be confined to certain faculties, or to disappear temporarily, or to show themselves feebly. These are the states which usually give rise to difficulty and to difference of opinion. It is not certain whether in them testamentary capacity remains or is destroyed. There is not, in short, a general agreement as to their effect, and rules for their settlement are not easily laid down.

It is about such states, therefore, that we think it will be most useful to speak, and accordingly we shall discuss, *first*—

The bearings of what is called partial insanity on the testamentary capacity. The term partial insanity, as used here, has not the meaning given to it by some writers, but simply refers to states in which the mind seems to disclose its insanity in one direction or on one point, while it appears to act normally and healthfully in other directions.

We shall examine, *secondly*, the bearings of what are called lucid intervals on will-making, and endeavour to explain the origin of the difficulties which surround this subject.

The *third* point we shall take up is the influence of a general weakness of mental power on the testamentary capacity. It is clear that this must give rise to much disputing, since there are all degrees of mental power among men, just as there are all degrees of bodily power. On every step of the ladder, from an idiot up to Newton, there stands a man. At which step of the ladder does testamentary capacity end or begin?

We shall, accordingly, first examine the bearings of partial insanity on testamentary capacity.

Lord Hale says there is a total insanity and a partial insanity of mind—*quoad hoc vel illud insanire, et quoad omnia insanire.* The doctrine is applicable to civil cases generally, but to will cases more than to any others.

In the endeavour to show what is meant by it, perhaps I cannot do better than begin with the narration of a case. I choose one which is interesting in several respects:—

"Mr Simon Browne, a dissenting teacher, of exemplary life and eminent intellectual abilities, after having been some time seized with melancholy, desisted from the duties of his function, and could not be persuaded to join in any act of worship, either public or private. His friends often urged him to account for this change in his conduct, at which they expressed the utmost grief and astonishment; and, after much importunity, he told them 'that he had fallen under the sensible displeasure of God, who had caused his rational soul gradually to perish, and left him only an animal life in common with the brutes; that it was, therefore, profane for him to pray, and incongruous to be present at the prayers of others.'"

He believed that this calamity had overtaken him "in consequence of having accidentally taken away the life of a highwayman, although it was done in the act of resistance to threatened violence, and in protection of his own person. Whilst kneeling upon the wretch, whom he had succeeded in throwing on the ground, he suddenly discovered that his prostrate enemy was deprived of life. This most unexpected circumstance produced so violent an impression upon his nervous system that he was overpowered by the idea of even involuntary homicide; and for this imaginary crime fancied himself ever after condemned to one of the most dreadful punishments that could be inflicted upon a human being."

Grief, occasioned by the death of his wife and only son, with a consequent derangement of his bodily health, predisposed him to be thus injuriously influenced by what would have done no injury to most men, and none to him, in ordinary circumstances.

He continued for eleven years—or to the end of his life—inflexible in the opinion that the Supreme Being had "annihilated in him the thinking substance, and utterly divested him of consciousness; that though he retained the human shape, and the faculty of speaking in a manner that appeared to others rational, he had all the while no more notion of what he said than a parrot."

With reference to this strange belief, Dr Aiken observes that, "of all the recorded delusions to which the human mind is subject, none perhaps is more remarkable than this, which, apparently, could not be put into a form of words for description without demonstratively proving its fallacy."

Being once importuned to say grace at the table of a friend, Browne excused himself many times; but the request being still repeated, and the company kept standing, he discovered evident tokens of distress, and, after some irresolute gestures and hesitation, expressed with great fervour this ejaculation—"Most merciful and Almighty God, let Thy spirit, which moved upon the face of the waters when there was no light, descend upon me, that from this darkness there may rise up *a man* to praise Thee."

During all this time the intellectual powers of his mind subsisted in their full vigour—his conceptions were clear and his reasoning strong. His affections also were healthy and active, and in the affairs of life he conducted himself prudently.

But the most astonishing proof of his intellectual integrity or excellence during this period is "A Defence of the Religion of Nature and the Christian Revelation," which he then wrote in reply to Tyndal's "Christianity as Old as the Creation." This book is universally allowed to be the best which that controversy produced, and it is a standard work still. He dedicated it to Queen Caroline; and in that dedication he disclosed his delusion, though there is no trace of it whatever in the work itself, which I have read.

His friends found means to suppress the dedication, "wisely considering that a book, to which it should be prefixed, would certainly be condemned without examination;" but, fortunately, the document itself was preserved, and fell eventually into the hands of Dr Hawksworth. Though it reveals his delusion and the power it had over him, it is still nowhere feeble. He speaks of himself as "a being such as history cannot parallel," and prays her Majesty, "in her most retired address to the King of kings," to make it her devout request that her reign might be made renowned to all posterity "by the recovery of a soul now in the utmost ruin." Newton brought the case under Cowper's notice in the hope of doing him good, and this elicited from Cowper a short letter, which is a good lesson to the student of insanity.

Browne was born in 1680; he became ill in 1723, and he died in 1732. During this long illness, having no charge, he had much leisure, and he wrote not only the learned book I have mentioned, but his scarcely less learned or less celebrated "Answer to Woolston's Discourse on the Miracles of our Saviour." He also wrote a "Disquisition on the Trinity," and compiled a Greek and Latin Dictionary. In none of these can a vestige of his insanity be anywhere detected. I possess a copy of his reply to Tyndal, on the flyleaf of which there is a note on Browne's case in the handwriting of Porson. This gave an interest to his case, which led to some little research, of which the narrative I now conclude is the result.[1]

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[1] This account of Simon Browne is taken from "The Adventurer," "The Gentleman's Magazine," "Arnold's Insanity," "Southey's Life of Cowper,"

We have here, then, a man who was most manifestly insane; he had a strongly-marked and fixed delusion; in certain circumstances it ruled his conduct; it utterly disqualified him for holding his office; it changed the whole current of his life. It did all this, and yet left him able to write learned and argumentative treatises and to compile a dictionary, to exercise his natural affections in a healthy manner, and to act rationally in the ordinary affairs of life.

This is what is understood here by partial insanity; and the question with us now is, Whether a person in this or in a similar state can make a valid will—whether medical science and law are agreed as to this?

"What," it is asked, "if the mind, though possessing sufficient power undisturbed by phrenzy or delusion, to take into account all the considerations necessary to the proper making of a will, and producing a rational and proper will, should be subject to some delusion, but a delusion which neither exercises, nor is calculated to exercise, any influence on the particular disposition? Ought we in such case to deny to the testator the capacity to dispose of his property by will? It must be borne in mind that the absolute and uncontrolled power of testamentary disposition conceded by the law, is founded (*as we have shown*) on the assumption that a rational will is a better disposition (*on the average*) than any that can be made by (*an inflexible rule of*) the law itself. If, therefore, though mental disease (*or insanity*) may exist, it presents itself in such a degree and form as not to interfere with the capacity to make a rational disposition of property, why, it may well be asked, should it be held to take away the right? It cannot be the object of the legislator to aggravate an affliction, in itself so great, by the deprivation of a right, the value of which is universally felt and acknowledged. If it be conceded, as we think it must be, that the only legitimate or rational ground for denying testamentary capacity to persons of unsound mind is the inability to take into account, and give due effect to, the considerations which ought to be present in the mind of a testator in making his will, and influence his decision as to the disposal of his property, it follows that a degree or form of unsoundness which neither disturbs the exercise of the faculties necessary for such an act, nor is capable of influencing the result, ought not to take away the power of making a will, or place a person so circumstanced in a less advantageous position than others with regard to his rights."[1]

These principles, laid down by Chief Justice Cockburn, have guided the best decisions of the law in this question.

But we are still left to ask whether there is *in fact*—in medical experience, that is—a partial insanity of the mind which really

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"Reid on Nervous Affections," "Aikin's Biog. Dict.," "Allibone's Dict. of English Literature," etc.

[1] Banks *v.* Goodfellow.—Law Times, 13th Aug. 1870, p. 817.

leaves it free to act rationally in certain directions. Is not the mind of man an harmonious unity, which cannot be faulty here and sound there? Can we dismember the mind? May it not be said that in our psychical organization there is nothing partial—nothing fragmentary—and that between the different faculties there exists a principle of succession and *anastomosis*, which entirely prevents their detachment and isolation, so that when a part falls the whole must fall?[1]

These questions are not to be answered metaphysically. They are practical questions, and the answers must be arrived at by ordinary practical methods. We cannot, from the depths of inner consciousness, evolve solutions which will be satisfactory. We must go into the world and among men, and see what actually happens both among the sane and among the insane. The most ingenious *theories* are of no value. If the thing is so, it is so, and we must accept it, whatever reasons may be assigned for thinking otherwise. We must test the facts by the usual methods; and, if they stand the test, as practical men we have no alternative—we must travel the road they indicate.

First, then, among sane men,—what do we find there—what mental states do they exhibit to help us? We shall accept as sane those who are generally accepted as sane by the world—those who enjoy the social rights and privileges of sanity. Medico-legally this is clearly what we are required to do. From a purely medical point of view we might properly go further and refine more than we do, or ought to do, in a medico-legal view.

Do we not, then, find that some sane men are above other sane men in certain intellectual qualities? Are not striking contrasts exhibited among the sane in the exercise and energy of different faculties of the mind?[2] I refer to something more than a mere difference of general mental power. I refer rather to differences in the different faculties. May not some of these be strong in one man and weak in another, while there is little difference as regards the rest? Have we not seen a marvellous memory with a pitiable want of good sense and judgment? Have we not seen a wealth of imagination with a poverty of will—with facility, that is? Have we not seen a powerful intellect with a weak morality?[3] In short, is it not a matter of everyday experience, that men are neither equally, nor alike, sane; and that some men are admirably fitted to fill certain positions, and to do certain acts, in whom we should have little confidence in other positions and in doing other acts? I am speaking here of *sane* men, and it follows therefore that there is a mental sanity which is not equally complete in all its parts—that as regards the health of the mind its various faculties exhibit different degrees of health, even when, to the faculties as a whole, it may be quite proper to apply the term sanity.

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[1] See Legrand du Saulle, La Folie devant les Tribunaux. Paris, 1840.

[2] Ibid., op. cit.

[3] Ibid., op. cit.

Go a little further and come to the eccentricities, whims, oddities, and tricks of manner of the sane, and we find among them, far from unfrequently, fixed ideas, not obtrusive and not annoying to others, which we note as amusing and do not treat seriously, and which never raise a doubt as to the sanity of those in whom they occur; but which nevertheless are phenomena differing scientifically only in degree, and not in kind, from an insane delusion. It would be an illustration of this if we met a man who refused to let his right foot enter or leave a room before his left, and who was so under the sway of this trick that if by chance he made the mistake he would feel uneasy till he had retraced his steps to remedy it. I abstain from giving further illustrations of these fixed eccentricities, because they are so abundant that I might hit on one, allusion to which would disturb the comfort of some reader.

Go further still, and we reach phenomena—peculiarities of mental action—which we hear commonly spoken of as *almost like* insane delusions, and among the friends of the subject of them it is whispered that he must take care and not let them go too far—that he should try to exercise a control over them, and keep them out of sight—yet, away from this, the man is still felt to be what other sane men are. He is not considered insane even in that respect, though there may be some uneasiness in trusting him where the phenomena in question might be supposed to have an influence, and though such peculiarities may utterly disqualify him for many occupations, leaving him able, however, to fill others with much usefulness. All this is matter of common experience.

But let us go a step further still, and we find divergences from the average state in particular directions, which are so pronounced that we unconsciously find ourselves regarding them as states of mental unsoundness. And thus we get to what is called partial insanity—we reach states, in fact, which are more or less like that exhibited in the case of Simon Browne. Medical men perhaps see these more closely than other men—being admitted into a knowledge of them from which others are excluded. But no observing man can have failed to note cases in which the disorder of the mind seemed to show itself in one special direction, leaving the other faculties apparently without disorder. That in medical opinion the faculties of the mind can become separately enfeebled or deranged, is almost proved by the many proposals which have been made to classify mental diseases according to the mental faculties which are involved. The intellect, the emotions, the propensities, and volition are recognised in medicine as capable of exhibiting disorder more or less separately; and still further, where the emotions or propensities are involved, it is never held that *all* the emotions or propensities are equally involved.

In states of sanity and of insanity, therefore, we have seen that we may have unequal degrees of health in the different mental faculties. Instead of saying unequal degrees of health, we have only to say unequal degrees of want of health, to find ourselves landed in the doctrine of partial insanity.

Medical analogies would have led us to anticipate the truth of such a doctrine. But we do not rest it on these analogies, nor on any sort of *a priori* reasoning, but on what is actually seen to occur.

In this view of the matter, I believe, I have the highest authorities with me. Legrand du Saulle says, "that an insane person is not of necessity *entirely absorbed* in his insanity, and a certain number of his actions may bear the stamp of reason and free will." "I believe," he says elsewhere, "that insanity is sometimes so circumscribed, and that the understanding is so free in all other respects, that the patient appears in his right mind, so long as his attention is not directed to the point on which he errs." Royer Collard says, "it is a great error to believe that a lunatic is incapable of performing certain acts, which require the concourse of the intellectual faculties." Delasiauve says, "that a patient may be at fault on one point, and may preserve the exercise of a correct reason on others."

Feuchtersleben states his opinion very strongly. "During the predominance of one fixed idea," he says, "the understanding may be pronounced, in every other respect except as relates to this one idea, healthy, the will free, and the act imputable."

Similar opinions are held by Hoffbauer, Pinel, Verdier, Casper, Castlenau, etc.

Indeed, as Belloc has well stated, these opinions are practically acted on in the government of every asylum—"Is not all our influence," he asks,—"is not all our action based on the capacity of the lunatic to understand the advice and reproofs which are given to him, and to direct his conduct accordingly? In other words, do we not treat the majority of patients not as wholly but partially insane?"

What we have now to do is, to apply this doctrine to the making of wills.

The testators, of whom we are at present speaking, are not held to be sane—they are, on the contrary, admittedly insane; but it is held that, though insane, they are still capable of doing certain things in a sufficiently rational manner, to make it fair to them, and not injurious to society, that these acts should be held as valid. Among these things is the making of a will. This is one of the certain things which some of the partially insane are held to be able to do in a valid manner. To what extent this is correct, we have still to show.

In reading over the decisions in will cases, it will be found that many judges have been careful to point out that much mere power of mind is not required in a testator. In Harrison *v.* Rowan,[1] for instance, it is stated that "it is not necessary that the testator should view his will with the eye of a lawyer, and comprehend its provisions in their legal form." "His capacity may be perfect to dispose of his property by will, and yet very inadequate to the management of other business." The law is laid down in the same way in Den *v.* Vancleve, where it is further stated, that it is not necessary that a testator should possess his faculties "*in as great a degree as he may have formerly done.*" They may have been weakened, or "*impaired by age or disease.*"[2]

It is of great importance to bear this in mind, because if it were held that high powers of mind were needed in a testator, an exceedingly small number of the partially insane could be regarded as competent; and this for two reasons,—first, though many great minds come under the dominion of fixed delusions, still a large proportion of the partially insane, as is true of all the insane, are drawn from those who are not originally of great mental power; and, secondly, because in a very considerable number of cases the occurrence of fixed delusions is accompanied with, or leads to, some general impairment of mental power, which, indeed, is often the result of the very conditions that led to the establishment of the delusion. Of few cases, indeed, of partial insanity, can it be safely asserted that the seemingly unaffected powers are really and entirely unaffected and unimpaired.

So much for this consideration. There is another of still greater importance. When the provisions of the will are coloured by the delusion all seem to agree, lawyers and doctors both, that it should not stand. And this leads to the remark, that even in cases in which the signs of insanity seem clearly to take one direction and to refer to one subject, we should avoid setting strict limitations either to itself, or to its influence over the other faculties. We do not require to set such limitations in order to show that testamentary capacity may exist. But it will probably be just and right *in every case* to set aside a will in which a fixed delusion has shown itself in the testator, and has been followed either by a bizarre and nonsensical will, or has led to provisions which are unfair to kith and kindred, and which ignore the ties of affection and consanguinity. Property entails duties and obligations as well as confers rights and privileges. And if we leave with some of the partially insane their rights in finally disposing of it, it is because we believe that some of them are capable of remembering and acting on their obligations in a reasonable manner. But we do not leave the right with all the partially insane. Each case has to be considered on its merits. Either great oddity or unfairness in the wills of such persons, though the prominent delusion or delusions may not be disclosed in them, should always be held as very damaging to testamentary capacity; while, on the other hand, the fact that a will is rational in its provisions, should go a very long way to establish competency where the insanity appears to have been only partial.

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[1] Law Times of 13th Aug. 1870, p. 818.

[2] Ibid.

If the delusion or fixed idea is actually seen in the provisions of the will and has influenced them, this should be conclusive as to the testator's incompetency.

The subject will be taken up at this point in the next paper.

ARTICLE II.—*On the Stability and Health, the Ovulation and Granulation of the Organism, and the Degeneration of Tissue.* By Dr J. G. MACVICAR, Moffat, N.B.

OUR life, considered as *passive*, consists in the motions which are proper to the particles of our bodies during their progress towards a more perfect state of existence, namely, the fully individualized or aeriform, instead of the concrete. Towards this they are urged not only by that tendency towards morphological perfectionment which characterizes the entire material economy (for the aeriform is a more perfect state than the concrete), but by the fact that they existed as aeriform before they existed as concrete; for the law of reversion holds good in reference to the particles of which organisms consist, no less than in reference to these organisms themselves.

Our life, considered as *active*, on the other hand, depends on the incidence and the action on us of the vital air or oxygen of the atmosphere, as will appear more fully as we proceed.

Our life, as a whole, thus depends on two causes, both of them insisting upon atomic and molecular motion, and of both of which the normal issue (nothing preventing) is the escape of the organization into the aeriform state.

The wonder is that the non-aeriform, the moist-concrete state, on which plainly the continuance of our existence as individuals depends, can be maintained so long, say in man (barring ill-usage and accidents) for nearly, if not quite, a hundred years. Not less than three-fourths of the entire weight of the body consist of aqueous matter, which, if detained in a sponge merely, and placed in the same conditions of existence as we are, would go off in vapour in a few days. And of the remaining fourth part, nearly one-half consists of elements which, when free, are aeriform also. How, then, may it not well be asked, do our bodies succeed as they do in growing and developing as concretes for many years? And after having attained to maturity, how do they continue to subsist in unity and strength for many years thereafter? No wonder physiologists, no less than considerate observers in general, have concluded that surely there must be here something else and something more than merely the physical and chemical properties of the material elements. And indeed, in having been led to this conclusion, they have been led, in so far at least as man is considered, to a great truth. In man at any rate there is something more and something else than the material atoms of which his organism consists. There is the soul, whose real yet non-molecular nature and natural survival at death I have elsewhere set forth[1] in much the same way as scientific facts in general are set forth and held to be established. But this consideration cannot help us in explaining the remarkable permanency of our organization in the midst of unceasing change, since a similar, nay, a superior permanency continues to exist where manifestly there is no soul,—in the seed of a plant, for instance, which may remain concrete and retain its life for thousands of years.

Before invoking the aid therefore of other principles to explain phenomena which are confessedly of a purely mechanical character, wholly consisting, as they do, in form and motion, it is surely desirable to consider well and to exhaust the possibilities of the functioning of those wonderful morsels of creation, the organic elements, of which all living organisms consist.

Now, looking to the question of long-continued life in this point of view—that is, the question how the elements of our bodies, which are in the main aeriform, are detained in the massive state so long—it is immediately worthy of remark, that we find among them one which at all known temperatures is incapable of the aeriform state; for such is carbon. This element is therefore well suited for being a cement for holding the aeriforms together in one organism, or at any rate for being a sheet-anchor to prevent them from flowing as fast as the tide. Its atomic weight also is so light that but a small weight of it generally diffused through the organism, may go a long way in holding the aeriform elements together, so as to detain them in the condensed or concrete state. Such, then, is the first step in our theory of organization, in respect of the fact that all organisms are, as they must be, concretes.

Though the greater part of the body consists of particles which are ever tending towards the aeriform state, yet organization becomes possible, and organisms owe their concrete state to the fixed and fixing character of the carbon which enters into their composition. It is the peculiar relation of this element to the aeriform state that renders non-ephemeral life possible.

But here it is also to be remarked in reference to such organisms as we are now contemplating, that the fixing and concreting power of the carbon which enters into their composition is greatly aided by the differentiation of their tissues. No phenomenon is more familiar in chemistry than that, in order to unite and remain united or concreted, the elements placed in juxtaposition should be dissimilar. Now, the differentiation or specialization of tissues is merely an example of this condition on the large scale. In fact, that like should first produce like, and then both separate, is not the law of animal and vegetable nature only, but of all morphological action whatsoever. Thus, if a small concrete embryo must, in order to the existence of a full-grown animal, grow in a liquid medium, that medium would soon make it like itself—that is, it would soon liquefy or dissolve it away, if it were not made, whilst it grows, to develop in a differentiated way. And still and on into the full-grown animal frame, the differentiation of the tissues, in the midst of the liquids and aeriforms which enter into the structure of the body, assists the carbon to maintain the organism in the concrete state.

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[1] See "A Sketch of a Philosophy," Pt. I. c. ix. Williams and Norgate.

But it has been already stated, that life in the largest sense (that is, considered as possibly existing where yet there is not the possibility either of thought or feeling) consists in motion. If, then, carbon be, as has just been stated, such a fixed and fixing substance, how, considering the abundance of carbon in nature, may it not well be asked, is life maintained? If the carbon gain the ascendant, must not all become fixed and still; must there not be first sleep and then death? Now, this must be admitted. Carbon is the true hypnotic and narcotic principle. And the normal medicines and poisons of this class, in so far as their active, that is their polar parts, are concerned, are either carbons or isomorphs of carbon which function similarly.[1] Continued life therefore depends as a primary condition on the regulation of the supply of carbon in the organism. And the condition of bodily life and health in the adult may be expressed in general terms by saying that there must be an equivalent action in the tissues of *escape* directly or indirectly into the aeriform state, and of continued *fixation* in the concrete state by carbon. Our food must indeed contain other elements along with the carbon, especially those vapours (common and ammoniacal) in the concreted state, on whose nisus to regain the aeriform state our passive life depends; but, as has been already said, the carbon (in single particles) is an essential ingredient.

And here the important question occurs, Might not the carbon, after having been once introduced into the organism, have been made to serve over and over again, and so the necessity have been avoided of consuming every day a quantity of carbon-containing food, to obtain which gives rise, in the main, to "the struggle for existence" and manifold miseries? To this the answer is, that such an arrangement is conceivable. But it is certain that in that case our life would be wholly passive and somnolent; in fact, no better than a continual hybernation. The carbon, in letting one aeriform element go free while it fixed its successor, would consume as much force in the one case as it would generate in the other. Moreover, though such an arrangement is conceivable, it may be shown that with the organic elements, such as they are, it is not possible. The carbon must fall in with the other elements in pursuing the course of life. And, however much addicted to the use of the spirit of sal volatile some persons may be, yet both the aqueous matter and the ammonia which constitute that genial stimulant must be elaborately steadied by carbon through the action of living organisms, before it come to be concrete wholesome food. It is indeed valuable as concrete matter only in as much as it can act, in part at least, as aeriform, or as matter bent on the aeriform state. But in order that the spring may give motion to the timepiece, it must be well wound up, or, as we may say, rendered as concrete as it may. And similarly, the concrete particles in food are springs wound up, or, more generally, the food itself is a spring wound up, the unfolding of which gives motion and sustains life.

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[1] In the molecular morphology which I advocate, it comes out that the polar parts of nitrogen—the halogens, phosphorus, arsenic, antimony, and other anæsthetics and poisons—are either carbons undecomposably soldered to the equatorial part of the atom, or isomorphs of carbon. But the life of the organism may be rapidly destroyed in many ways, and the theory of poisons consists of many chapters.

But if vapoury matter in the food attains the aeriform state, directly or indirectly, as common vapour or (carbonate of) ammonia by spontaneous determination, how does the carbon, which is in itself of a fixed nature, come to do so? This is now the question for us, and it is that which carries us from what may be called the passive to the active life of the organism; for life, as has been stated, in so far as it consists merely in the movement of the organized vapours towards their own liberation, is merely the unbending of a spring, and therefore merely passive or exhausting.

Now, here, strange to say, this same carbon which we have hitherto had to regard as merely fixing and preventing life, which, but for it, would have been exuberant (but ephemeral), has also been chosen as the recipient of new energy to the individual organism from the cosmos, and as a fountain of activity! At first we have to regard it as still within the organism, and threatening to bring all to a standstill and to death. But when thus and there it is laid hold of by a certain ever-active element in the atmosphere, which formerly bore the expressive name of vital or empyreal air; and by this new element every atom of carbon is supplied with two wings; and by these wings it is enabled to join in the upward and outward movement from the organism, under the name of dioxide of carbon (less happily carbonic acid). And thus is the organism delivered from the carbon, to which indeed it owes its existence as a concrete, but which, as has been shown, would have soon sealed it in death, if it had not been removed.

Still, so far, the agency of the oxygen only enables the carbon to join in the passive life of the organism, while it has been affirmed that the carbon is also made the occasion of imparting to the organism active life from the cosmos. How then does this come about? The answer is, that the oxygen, when it comes near the carbon-atoms within the organism in that loose and used state in which they are serving no good purpose there, impinges on them with such force, that æthereal energy is set free and much heat is generated between them, just as in all fires without flames—for such fires are nothing else but collisions between particles of oxygen and of carbon. Now, when local heat is generated energy is generated; nay, of all the forms of energy locally generated, heat is that which is the most available for effecting mechanical action. Hence, while the organism in virtue of the spring of its materials (ever tending to unbend into the aeriform) has a *passive* life, which the carbon regulates like an escapement in a timepiece, it has also an *active* life, receiving as it does continually new supplies of energy from the atmosphere; the organism, in virtue of the carbon that is in it, serving as a diamond anvil on which the strokes of the vital air are continually coming down.

Our life, therefore, is, on the one hand, *statical*, or such as is ever aiming at self-conservation and repose, in virtue of an equilibrium between the oppositely-tending elements of which the organism consists, the constitutional vapours and gases ever tending to be off, and the carbon ever tending to fix them. On the other hand, it is also *dynamical*, in virtue of new energy received every moment from the cosmos through the vital air of the atmosphere.

And here the question naturally suggests itself, How long can the organism, under this arrangement, be expected to live and last? Now, though here there are two modes of action which, looking to nature generally, it seems difficult to reconcile, and though, in consequence of the perfect elasticity of the material elements of which the organism consists, the action on both sides of the equation must be always rhythmical or pulsatory, yet, if there be a cloacal action as an appendage to the respiratory adequate to carry off such elements as the vital air cannot succeed in rendering aeriform or liquid, no reason appears, when contemplating the fully developed organism in itself, and apart from its previous history, why we might not live for ever. But as we are, and come to be, this is impossible. In order to such immortality the organism would require to be built up in perfection at once. A state of being attained only by growth and development from an embryo forbids such a supposition as immortality. In that case, just as the organism under the law of assimilation acting in relation to *space* after having manifested the ancestral forms and structures must come to a stand, so under the same law of assimilation acting in relation to *time*, it must begin to live its past life over again and aim at reversion to embyro, nay, to cell, again. Now, during this period of reversion, the volatile elements must tend to gain upon the consolidating particles of the organism; and thus the epoch of full development must be also that of middle age, with declining years beyond until a second childhood is reached; and of this the issue must be, that the whole organism having lived its day, shall tend to break up into an aggregate of cells, and so to cease to function as a unity, and die.

Happily this tendency to revert to the state of the embryotic or individually cellular state is not really end, which at first sight it seems to be. For while in slightly differentiated organisms it succeeds in the individual in constructing out of the existing organism, buds, spores, ova, which can continue the species by succession; and in more highly differentiated races, germ and sperm, which taken together can do so (Mr Darwin supposes a panspermism!); in that most highly differentiated species, in which all organism culminates, in man, it gives birth, not from the material, but from the æthereal tissue of the organism (an atmosphere or ynamosphere of which accompanies every material element), to an unity more perfect than that of bud or spore, and more æthereal than germ or sperm or pansperm; yes, it gives birth to a true unity, an immaterial energy or spirit, of which the bodily organism is thus the nurse, and whose destiny is to be assimilated (of course) to the organism during the epoch of its development and residence in the organism, but also to survive, and forsaking the organism when dead, to enter into the realm of light, which is truly its mother, and which has been also previously, though on a small scale, its home. (For the light material and wonderfully-expanded molecules of the cerebral organism which the eye can detect, are but a scaffolding to maintain the unity of the invisible æthereal tissue of which that organism mainly consists, and on the duly centralized currents in which its normal functioning mainly depends.)

Although, therefore, death, and the antecedent sufferings which it implies, be a great punishment, yet, considered on the grand scale, it is an evil more in seeming than in reality. In reference to that species in which the animal kingdom culminates, in man, the maintenance of the race, not by the immortality of the individual, but by a succession of individuals, is productive of grand results. It both multiplies, as fast as life and death, beings capable of endless intellectual enjoyment, and it renders creation on the great scale as it obviously is in detail, cyclical; so that what begins by Spirit (that of the Creator namely, and the Spirit world) ends or reverts by giving to creation spirits again, now secure from the reach of death and the risks to enjoyment, which sensibility in a material vehicle implies.

But enough has already appeared to lead to the apprehension that these risks of suffering in life, whether short or long, must be very great. Nothing, indeed, but the maintenance of such continuity, both in the structure and the functioning of the individualized organism as if it were really a unity, can prevent them; for feeling is an unity, and its wellbeing, that is, enjoyment, implies unity, at least as a current circulating through the whole field which it embraces. This may be difficult to demonstrate, but it will not be disputed. Accordingly, it is wonderful to what an extent provision has been made for the maintenance throughout the entire animal organism of unity. Thus, in the first place, there is the comparatively stable continuity and unity of the connective tissue, which is such that, if the various organs were all dissected and dissolved out of it, that tissue would consist of a united set of moulds for every one of these organs, and would be itself a model of the whole body. In the second place, there is the establishment of centralized parallel but closed currents; now radiating and returning all through and over, their centre the brain; now circulating even to the vasa vasorum in the circulation commonly so called, the centre the heart; now plying between the periphery and the interior, as also between special organs, by a general permeability of all the tissues. Admirable is the art employed to maintain a unity of action and reciprocal interdependence among all the parts and particles of the body, amid so much differentiation as actually exists. Nor is it wonderful that it should be so; for, upon the maintenance of this unity, as has been stated, the health and happiness—in one word, the wellbeing—of the individual depends.

Meanwhile, as has been shown, there are physical, nay, organic laws constantly at work to impair that unity. Among *organic laws* working in this direction, ovulation, or a tendency to reversion to the state of ova, may be mentioned, for this implies in the organism as a whole a tendency to the construction of cells in the organism, especially after the age of maturity has been reached. And thus we have to look for infiltration and deposition of granules or cells among the tissues, these tissues remaining otherwise entire. And among *physical laws* may be mentioned that constantly operating natural analysis due to specific heat, in virtue of which, in every mass which is imperfectly individualized, centres of individuation tend to establish themselves, so that the mechanical deposit tends to become crystalline or granular, and ultimately to allow itself to be separated into powder—a process which culminates secularly (or suddenly on the supply of adequate heat) by the complete individuation of the constituent particles as aeriform. Now, these laws imply not only the infiltration, but the transformation, degeneration, and wasting of tissues. And if the granules resulting be neither capable of the aeriform state, so that they may be eliminated by the lungs or the skin, nor soluble in the liquid that circulates through the tissues, so that they may be eliminated by the cloaca, their detentions in the organism cannot but be more or less injurious.

Thus, corresponding to any defect in that vital energy and intimate and universal circulation of vital fluid, nervous and sanguineous, by which the unity of the organism is maintained in health and especially in youth, the appearance of granulation among tissues is to be looked for, and that of one or other of two kinds—first, *infiltrations* among healthy tissues, and, secondly, *degenerations* of tissue itself, substituting that tissue and ruining its functioning.

Yet all we find here is, as is generally found, that these products, when morbid—whether the infiltration or the granulation of the tissues—are merely the products of normal action become abnormal through excess or defect of balance. Reversion, or the tendency of developing and developed matter, now become a mass, to be a cellular mass, and to construct within itself cells similar to what itself once was as germ and sperm in appropriate organs, is normal and necessary to the continuance of species in our planet. But where it cannot succeed in completely doing so—that is, in others than in the appropriate organs—still that it should tend at least to do so and to construct cells generally, is unavoidable, unless the tendency be duly arrested by that which maintains the organism as a unity. Aeriformation also implies a tendency to the individuation of separate particles, and is the very spring of life; but either process, even when it succeeds, implies fatal wasting away, unless it be met both by the nisus of the organism at unity, and by an adequate supply of suitable food. The conditions of continued health, therefore, as opposed to the degeneration of the tissues, in a general view we might indicate as—

1. A moderate and reserved reproductive habit.
2. Equable but well-sustained all-embracing vital currents by heart and brain at a temperature not higher than necessary.

As a most elementary normal illustration of the construction and infiltration of granules in an organic tissue, there may be mentioned that of the corpuscles of the blood. It is true that the blood, being liquid in life, is not usually considered as a tissue, but there can be no doubt that its integrant elements are large and highly composite, and, though mobile among each other during life, have yet organic or specific relations to one another, constituting as to the whole in health a most exquisite structure, to which the term tissue may be justly applied. Now, it is to be remarked that, as we ascend the scale of the animal kingdom as to species, and in the individual as to age from intra-uterine life to maturity, the corpuscles of the blood increase in number and variety. This, then, is a verification of the theory which ascribes their construction in the plasma, in part at least, to the same law as gives germ and sperm corpuscles in the generative glands, namely, the fact that the entire vital energy and organism of the individual was primarily itself corpuscular, which fact the organism tends to perpetuate under the law of assimilation (reversion), by forming corpuscles within itself where suitable matter is supplied, as normally it is in the blood, the generative glands, etc., and abnormally in other regions.

As not less normal perhaps than the blood-corpuscles, may be classed fat-corpuscles, which, moreover, the former seem to involve. Such corpuscles do indeed exist in all suitable food, but it is certain that the organism has also the power of constructing them out of amylaceous, albumenoid, or other material. And when fat does not exist in excessive quantities, it is easy to see that it must be of great value in the organism. The elemental molecule of stearine itself is the most beautiful structure which chemistry has to exhibit. It is a perfect store both of hydrogen, with which to construct aqueous or volatile matter, and carbon, with which to construct fixing matter; and both for regulating the temperature of the organism. The fat or oil element is also eminently spherical. When infiltrated into fibrous tissue, it therefore serves well as dunnage to prevent the coalescence of fibres, and to secure room for their normal development. It also comes out in that theoretical synthesis which molecular morphology enables us to accomplish, that the fat or oil globule will tend to develop into a pigment granule on the one hand, and, when duly supplied by oxygen, into carbonate of lime on the other—a statement which will seem very strange to those who have not made themselves acquainted with molecular morphology, which I advocate, and which explains so many phenomena in physiology.

But an excess of fat-corpuscles within the organism must bode evil not only as so much useless weight, but because, proportionally to its quantity, it must act assimilatively or catalytically in producing more; and, indeed, may in this way strengthen, or even induce, in the organism the habit of fatty degeneration, in which fat is not merely infiltrated into sound tissues, but generated by the transformation of these tissues into itself, with loss of continuity and contractibility, and indeed of life; all which happens to an immense extent in dead bodies, when in the grave, especially when massed together.

Somewhat similar remarks might be made with regard to the construction of glycogenic granules in the organism, the value of which, when generated in the right place (the liver) for the construction of tissue, I have shown in this Journal.[1] But as to the amylaceous degeneration, etc., these products seem rather to belong to that category which contains those corpuscles which, under the effort of nature to get rid of them by solution of the adjacent tissue, constitute the various forms of disease so often occurring which is too well designated by the term malignant.

Considered, however, generally, and merely as consisting in the development of separate cells where there were otherwise continuous tissue, it is not possible to see how man can altogether escape from a liability to them so long as he is himself the product of growth and development from a cell, nor could indeed afford to purchase entire immunity, since in that case he must sacrifice his mother's milk, his means of continuing the race—nay, must lose his own soul.

We must therefore accept this liability, merely doing what we can to prevent everything that is excessive and abnormal in this line, by taking all measures to maintain, in full tide, that all-pervading current of vital force, nervous and vascular, by which the whole organism is preserved as a unity. How to prevent otherwise a fatty, or osseous, or watery, or diabetic, or tissue-degenerative habit, when it shows itself, is not easy to be discovered.

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[1] For August 1868, art. iii., "The Hepatic System in Animals an Apparatus for preventing the Animal Cells from being coated by Cellulose." See also Nos. for August and September 1871.

ARTICLE III.—*On the Nutrition of Muscular and Pulmonary Tissue in Health and in Consumption; with Remarks on the Colloid Condition of Matter.* By WILLIAM MARCET, M.D., F.R.S.; late Senior Assistant-Physician to the Hospital for Consumption and Diseases of the Chest, Brompton, and to the Westminster Hospital, London, etc., etc.

(*Read at the Meeting of the British Association at Edinburgh, August* 1871, *and communicated on the present occasion in a condensed form.*)

THE object of the present communication is to show under what form the muscular and pulmonary tissue undergoes the process of waste and repair in health, and when the body is labouring under consumption. The inquiry was first applied to the nutrition of tissues in the healthy condition, and the results obtained were embodied in a paper communicated, last April, to the Royal Society. Since then I have completed a similar investigation with respect to human muscles and lungs, after death from consumption, and now also beg to offer the results of this inquiry.[1]

In the course of these researches my attention was directed to the condition of matter Graham has called *colloid*—a subject closely connected, as will be seen, with the phenomenon of the nutrition of vegetables and animals, and on which a few remarks may not be misplaced on the present occasion.

Graham discovered from his admirable investigation into the laws of liquid diffusion, that, as a rule, substances which cannot be obtained in the form of crystals, such as gelatine, fail to diffuse readily when in a state of solution in water; and that, on the other hand, substances which can be prepared in the form of crystals, such as common salt or sugar, are as a rule readily diffusible. The former he has called *colloids*, and the latter *crystalloids.*

When colloid substances solidify from their state of solution without being dried up, they either gelatinize or become gummy and adhesive; while crystalloid substances solidify into crystals.

Now a jelly, although containing an enormous proportion of water, is not exactly wet, and cannot be considered as holding water in the free state, obviously because of the peculiar relation which exists in a jelly between the water and the solid substance; but if a strong solution of common salt be brought into contact with a jelly of gelatine, it softens down and becomes nearly liquid, apparently because of this relation, whatever it is, being destroyed. Chloride of sodium may, therefore, be said to interfere with the colloid condition, or one of the colloid properties, of gelatine. An excess of water may be considered as producing a similar effect, as a too highly dilute solution of gelatine will not gelatinize on cooling.

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[1] In order to make this communication as short as possible, I have been compelled to omit many particulars which may be of interest or useful as assisting to establish the facts resulting from my inquiries. These will be published subsequently in full.

I shall have an opportunity of showing that, in certain pathological conditions of tissues, the amount of chloride of sodium and water they contain is increased beyond the normal proportion; in that state the tissues become wet, just as if they had been subjected to a loss of that peculiar relation between a solid substance and water which constitutes the gelatinous state.

Colloid Condition of Vegetables.

The animal body, taken as a whole, may be considered as a colloid mass, both blood and tissues being colloids. The colloid state of the substances this mass consists of can be traced into the vegetables used as food.

I have found, by experimenting on wheaten flour, potato, and rice, that these different kinds of vegetable food contain a considerable proportion of colloid phosphoric acid and colloid potash, or of phosphoric acid and potash which failed to pass through a dialyser in twenty-four hours;[1] but the most remarkable of these results was the fact that, notwithstanding the great difference in the composition of the above vegetables, yet the proportions of phosphoric acid and potash colloid to the total amount of these substances respectively, was nearly the same in the three cases; this is shown in the following table:—

Found on 100 grammes.

	Phosp. Acid.	Potash.
Wheat,	0·3142	0·1797
Potato,	0·0911 0·111	0·5801 0·678
Rice,	0·202	0·0856

Proportion of Colloid to total.

	Total Phosp.	Coll. Phosp.	Total Potash.	Coll. Potash.
Wheat,	1	0·60	1	0·21
Potato,	1	0·58 0·54	1	0·28 0·24
Rice,	1	0·50	1	0·22
Mean,	1	0·55	1	0·24

Consequently, the mean proportion of the total to colloid phosphoric acid in wheat, potato, and rice is nearly two to one; and of total to colloid potash nearly four to one; and these mean results are nearly the same in the three cases.

In the course of the present investigation a number of samples of ox-blood were submitted to analysis, much in the same way as the above vegetable products; and it is very remarkable that in two cases—one especially—the proportions of phosphoric acid and potash colloid to total respectively were found to be nearly the same as those existing in wheat, potato, and rice; from which circumstance it appears that, under certain physiological conditions consistent with health, the proportions of colloid to total phosphoric acid and potash respectively actually remain the same in the blood as in the food from which this blood has been derived, establishing a remarkable relation between blood and vegetable food. This is assuming, of course, that the food taken by the animals whose blood was examined exhibited colloid proportions of phosphoric acid and potash similar to those found to exist in wheat, potato, and rice.

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[1] In this experiment the flour was mixed with a large proportion of water, and the nearly fluid mass was subjected to dialysis.

It appears at first sight remarkable that such substances as colloid phosphoric acid and potash should really exist, these substances being only known, so far, as crystalloids. Such, however, is a fact; and not only do plants prepare them, or take them up from the soil, but I have succeeded in obtaining these substances artificially, by dialysing mixtures of phosphate of soda and chloride of potassium. The whole of the chlorine and sodium, or nearly so, passes through the dialyser, while a small proportion of phosphoric acid and potash are left, which no longer crystallize, but assume a thick adhesive character when sufficiently concentrated.

It does not appear unlikely that these colloid substances may be formed in the soil by a process of diffusion owing to the action of rain-water; but I also believe that vegetables have the power of preparing them, or rather separating them from crystalloids, the latter being washed away principally from the leaves by the rain, while the colloid substances remain.

Constitution and Nutrition of Muscular Tissue in Health.

After considering very closely the present subject, I have come to the conclusion that muscular and all other animal tissues are composed of three different sets of constituents, quite distinct from each other. One, which forms the fully-assimilated or ripe tissue; a second, constituting the material destined to the nutrition of the tissue; and a third, which includes those substances resulting from the waste of assimilated tissue—they are effete, and on their way out of the body. The nutritive material, together with that which is effete, may be considered as pervading the tissue in a state of solution; while the tissue proper or actual fibres, connective tissue, and other anatomical elements, may be considered as insoluble.

The organic material, which becomes transformed into fibres and cells, is albumen; the mineral matter is phosphoric acid and small proportions of potash and magnesia. Chlorine and soda are present in minute quantities, but do not form part of the tissue proper.

The method adopted to separate these three sets or classes of constituents of muscular tissue and effect their analysis was as follows:—200 grammes of muscular tissue were minced and extracted with 500 cubic centimetres of distilled water, the mass being strained through calico or muslin. The volume of the extract and weight of the residue in the cloth were determined, and this residue was dried in order to ascertain the amount of water it contained. The albumen, phosphoric acid, and potash, were now determined in the extract, together with the nitrogen in the filtrate from the albumen after coagulation by heat. Most of the residue left on first treating the minced flesh, and which had been dried, was very carefully incinerated, a portion of the mass being put aside and afterwards burnt with soda-lime for the determination of its nitrogen; the ash was submitted to analysis.

The water in the fibrous residue, from the original treatment of the flesh, represented so much extract; and the composition of this extract was calculated from the result of the analysis of the actual extract. By subtracting the numbers thus obtained for the various constituents from the amount of the corresponding substances found in the ash of the original insoluble residue, the difference gave the proportion of the substance in the tissue proper or the ripe or fully assimilated tissue, the nitrogen being calculated as albumen. Thus the first class of constituents was obtained. The second class was derived from the first by calculating proportions similar to the following: the albumen of the first class is to the phosphoric acid of that class as the coagulable albumen in the extract is to the phosphoric acid of the second class; the coagulable albumen belongs to the second class, and is taken into account for the calculation of every one of its constituents.

The third class of constituents was calculated from the composition of the total extract from which the constituents of the second class were respectively substracted.

Four analyses of ox-flesh, conducted as stated above, gave results agreeing with each other: the mean of these four analyses being as follows:—

On 200 grammes.

	1st Class. Muscular Tissue proper.	2d Class. Nutritive Material.	3d Class. Effete Material.
Albumen, . .	28·070	5·745	3·70
Phosphoric acid,	0·251	0·050	0·563
Potash, . .	0·086	0·017	0·764

The nutritive material I have stated to be in the colloid condition; this is not an assumption, but the result of actual observation, as I have, after dialysing flesh, and juice of flesh, for twenty-four hours, found the colloid contents of the dialyser to yield proportions of albumen, phosphoric acid, and potash similar to those obtained by calculation as described above.

The proof that the phosphoric acid and potash of the effete material are crystalloid, is the fact that the proportion of these substances present is precisely that which would be required to make pyrophosphate of potash or tribasic phosphate of potash with two equivalents of fixed base.

	Mean Found.	Found on 100.	Theory.
Phosphoric acid, .	0·563	42·4	43
Potash, ...	0·764	57·6	57[1]

The albumen of the effete material is not really albumen, but this substance in process of elimination, under the form of kreatine, kreatinine, and other crystalloid compounds, assuming, of course, that all other nitrogenized compounds present besides albumen are crystalloid.

As a final remark on the nutrition of muscular tissue, it is very interesting to observe that, as the proportion of coagulable albumen present must regulate the total amount of the nutritive and effete matter, it follows that there is apparently an accumulation of nutritive matter in flesh amounting to about one-third more than the quantity required for immediate use, because the proportion of albumen coagulable to the albumen in the effete state is 5·745 to 3·70; this may be considered a provision of nature to allow of muscular exercise during prolonged fasting.

Constitution and Nutrition of the Muscular Tissue of Fish.—The Salmon.

The analysis of a sample of salmon's flesh showed that it contained a much larger proportion of coagulable albumen (12·47) than that of the oxen (5·745), this being either a store for a rapid formation of flesh, so as to allow of violent muscular exertions without an increased supply of food, or a means for a speedy addition of muscular tissue. The potash and phosphoric acid of the effete material are not so completely crystalloid as in the case of ox-flesh, their proportions being:—

	Found.	Theory.
PO_5, . .	53·3	43
KO, . .	46·7	57

This probably accounts for the fact that a high proportion of these substances was found in the effete material.

I was not prepared for this accumulation of effete substances in salmon, the medium in which fish is living being such as to transform it into a perfect dialyser.

[1] The numbers found in the four analyses were:—

	I.	II.	III.	IV.
Phosphoric acid, .	43·8	43·7	41·7	40·4
Potash, . . .	56·2	56·3	58·3	59·6

On the part Blood takes in the Nutrition of Flesh.

This is an extremely difficult subject to investigate, and the results obtained have not proved, I regret to say, in proportion with the labour bestowed upon the work. It has, I believe, been satisfactorily shown that blood contains more albumen, phosphoric acid, and potash than an equal volume of serum of the same blood; and as those substances are precisely those which are required for the nutrition of muscular tissue, it might be concluded that the blood-corpuscles are not unlikely to be concerned in the nutrition of muscle, by taking up those substances muscular tissue requires and yielding them to flesh. In order to test the accuracy of this view, I undertook to determine experimentally whether the *excess* of phosphoric acid in blood over the proportion of this substance in an equal volume of the serum of that same blood, bore to the corresponding excess of potash a relation similar to that which I had found to exist between the phosphoric acid and potash in the effete portion of muscular tissue.[1] Out of six analyses of blood and serum, one yielded results agreeing very closely with the theory; with another the results agreed but approximately; and, finally, with the remaining analyses they differed.

The difficulties in a work of this kind are both analytical and physiological; they are analytical, inasmuch as there is a certain, although I believe but small, proportion of phosphorus which is oxidized in the process of incineration yielding too high a result for the phosphoric acid. Moreover, the greatest care must be taken in the incineration, lest a portion of ash be lost by volatilization during that part of the analysis. The general analytical result obtained was, that in ox-blood the phosphoric acid and potash vary but little in different samples of serum, while they may differ considerably in different samples of blood; but I invariably found the proportion of these substances higher in blood than in their corresponding serum. The difficulty of a physiological nature in an inquiry of this kind is the uncertainty as to the state of the animal with respect to its digestion and nutrition when slaughtered; it may have been feeding largely or very little in the butcher's stall, or it may be in an abnormal state of exhaustion because of its having been sent from the country a day or two before slaughtering. Two analyses out of six, agreeing tolerably with the theory (this must be considered in a physiological, not in a chemical, point of view), appear to show that it is not unlikely to be true, although of course it does not establish the correctness of the view. The relations obtained in these two analyses were as follows, and it is impossible to admit that they were fortuitous:—

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[1] Strictly, this relation could only be expected to exist if blood had exclusively muscular tissue to nourish, or if the nutrition of the other tissues was attended with the same chemical change as occurs in that of muscles. The skin and internal organs form but a small proportion of the whole body, and the nutrition of bones is a very slow process. On the other hand, the muscular tissue, which amounts to 40 per cent. of the weight of the body, may be considered as rapidly nourished, and consequently the nutritive power of the blood is concerned in a very large proportion, I should say four-fifths or nine-tenths, in the nutrition of muscles.

Relative excess in Blood over proportions in Serum.

	Found.	Theory.
Analysis I.		
Phosphoric acid, . .	44·7	43
Potash, ...	55·3	57
Analysis II.		
Phosphoric acid, . .	52·2	43
Potash, ...	47·8	57

Constitution and Nutrition of Pulmonary Tissue in Health.

The analysis in the present case was conducted precisely in the same way as in that of muscular tissue. Three samples of pulmonary tissue from three different oxen, submitted to analysis, gave results agreeing fairly with each other, the mean of which was as follows:—

On 200 grammes.

	Tissue proper.	Nutritive Material.	Effete Material.
Albuminous material,	19·895	13·029	1·410
Phosphoric acid, .	0·481	0·314	0·058
Potash, . .	0·051	0·033	0·451
Soda, . . .	(0·048)	(0·033)[1]	0·521 (total)
Chlorine, . .			0·439

On 200 grammes.	
Water, . .	158·0
Fat, . . .	4·28

It will be seen at once that there is a great difference in the composition of the effete material in pulmonary and muscular tissue; the effete phosphoric acid and potash in the lungs being 11·4 to 88·6, while in muscles their proportion is 42·4 to 57·6. This circumstance may be satisfactorily accounted for. I explained in a communication to the *Lancet* for February 2, 1867, how the expiration of carbonic acid from the lungs during respiration was caused by the diffusion of the gas from the blood through the membrane of the pulmonary tissue, and its final evolution, together with moisture. By passing through the substance of the lung-tissue, carbonic acid must combine with that portion of the potash which would otherwise be present in the free state, transforming it into a crystalloid and therefore diffusible condition. It may consequently be concluded that, in the process of nutrition of pulmonary tissue, the potash is mostly eliminated as carbonate.

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[1] The soda of the two first columns has been placed between brackets, because I do not believe any soda to be directly concerned in the nutrition of pulmonary tissue.

Constitution and Nutrition of Muscular Tissue in Phthisis.

The state of emaciation to which the human body is generally reduced in consumption is a certain indication that nutrition is greatly impaired in the present disease. Having investigated the subject of the nutrition of muscular tissue in health, I applied the same method of inquiry with the object of ascertaining the alteration this function undergoes in phthisis. The result showed that the nutrition of muscles in consumptive subjects is abnormal as to the quantity and condition of the water present—the quantity amounting to 166·5 grammes instead of 154 grammes for 200 of healthy flesh, and being therefore increased in consumption. Moreover, on examining the muscular tissue of consumptive bodies, it will be usually observed, especially where there is much emaciation, to be wet and soft, instead of being firm and dry as is the case after death from other diseases and with the flesh of animals slaughtered in health. It therefore appears that the water in flesh after death from tuberclosis, besides being in excess, is in a less colloid condition, or, in other words, has for the solid constituents of flesh less of that peculiar attraction it has in health, and which binds them together; and this circumstance must be opposed to the formation of muscular tissue in consumption.

Besides the altered condition of the tissue respecting its water, I find that the proportions of chlorine and soda in the muscles of consumptive subjects are higher than in health.

The water being in excess, will of course account for the solid constituents being deficient in 200 grammes of the flesh.

The following is a tabular statement of one of my analyses of human muscular tissue, after death from phthisis. Two others have yielded similar results:—

On 200 grammes.

	Tissue proper.	Nutritive Material.	Effete Material.	On 100. Found.	On 100. Theory.	
Albuminous material,	20·520	4·770	2·700			
Phosphoric acid, .	0·160	0·037	0·318	43·2	43	effete.
Potash, . .	0·035	0·008	0·418	56·8	57	
Soda, . . .	(0·021)	(0·005)	0·389 (total)			

On 200 grammes, flesh.

Water, . . .	166·5
Fat, . . .	3·64

The analyses show, that although the solid constituents of flesh—albumen, phosphoric acid, and potash—be deficient, still they exist in the same relative proportion as in healthy muscle,—the phosphoric acid and potash of the effete material bearing to each other the same relation as they do in pyrophosphate of potash, namely, 43 to 57, the exact numbers in the above analysis being 43·2 and 56·8.

The increase of chlorine and soda in muscles in phthisis is very remarkable; I do not consider these substances as contributing to the formation of the mature, or insoluble, tissue, although they are invariably distributed in very small proportions throughout its bulk, but they must be concerned in the formation of flesh. The following table shows the comparative proportions of chlorine and soda in healthy flesh, and in muscular tissue after death from phthisis—the mean being, for 200 grammes of healthy ox-flesh, chlorine 0·167, and soda 0·239; and for 200 grammes of muscular tissue, after death from consumption, chlorine 0·379, and soda 0·440:—

Chlorine and Soda in Muscular Tissue.[1]

In healthy Muscular Tissue (Ox-flesh).		
Analysis.	Chlorine.	Soda.
I.	0·196	
II.	0·164	
III.	0·184	
IV.	0·133	
V.	0·172	
VI.	0·212	
		0·297
VII.	0·210	0·333
VIII.	0·094	0·193
IX.	0·176	0·289
X.	0·117	0·172
XI. Human	0·182	0·155
Mean,	0·167	0·239
eq^{t}. to 0·275—Nacl.		

In Muscular Tissue from Human Consumptive Subjects.		
Analysis.	Chlorine.	Soda.
I.	0·264	
II.	0·343	
III.	0·292	
IV.	0·404	
V.	0·469	
VI.	0·433	
VII.	0·390	
VIII.	0·393	
IX.	0·357	0·438
X.	0·450	0·487
XI.	undetermined.	0·394
Mean,	0·379	0·440
eq^{t}. to 0·634—Nacl.		

It will now be interesting to consider how this increase of chlorine and soda in the muscles of consumptive patients may be accounted for. In health, there either exists in blood a force which retains in it the chloride of sodium it contains, or there is present in muscular tissue a power which prevents the passage of this substance into it, except in very small proportions; this force is opposed to the physical phenomenon of diffusion; chloride of sodium is the most diffusible of all substances entering into the composition of the body, and it is remarkable that there should be, during life and in health, a force preventing to a considerable extent the diffusion of this substance (assuming chlorine to be in combination with sodium in blood) from blood into muscular tissue. In consumption, however, this force is lessened, and the physical force of diffusion becoming proportionally increased, causes an abnormal passage of chloride of sodium from blood into flesh. This phenomenon imparts to the nutrition of muscular tissue in phthisis a physical character it does not possess in health.

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[1] The small proportions of soda, under the head of tissue proper, are not included in this table.

Constitution and Nutrition of Tubercular Pulmonary Tissue.

I have shown that the normal nutrition of the lungs apparently depends on a free passage of carbonic acid through their substance. When the function of respiration is either interfered with or arrested, the nutrition of the pulmonary tissue must be altered, or cease altogether, in which case putrefaction will rapidly set in. It is remarkable, however, that in death from phthisis, even where the tissue of the lungs is entirely destroyed, and therefore quite unfit for the purpose of respiration, it emits no smell of actual putrefaction; and from this circumstance I had concluded, long before undertaking the present inquiry, that even in this state the nutrition of the part had not ceased.

The portion of the lungs submitted to analysis had undergone caseous consolidation, and was more or less extensively in the stage of softening, being totally useless as organs of respiration; yet I shall show that the morbid product still underwent a process of nutrition, although different from that the pulmonary tissue had been subjected to in the healthy state. I have found the remarkable fact that, under the above condition, the material substituted to healthy pulmonary tissue undergoes a process of nutrition similar to that which is peculiar to flesh. In healthy lungs, the potash on its way out was found to be greatly in excess of the proportion necessary to make a crystalloid compound with the phosphoric acid present, and I had concluded that this excess of potash was eliminated through the agency of the carbonic acid emitted during respiration; after complete consolidation of the pulmonary tissue, no carbonic acid being given out, phosphoric acid takes its place, and pyrophosphate of potash or neutral tribasic phosphate of potash is formed, precisely as occurs in the nutrition of muscular tissue.

The method of analysis was precisely the same as that which had been applied to flesh and healthy pulmonary tissue.

The following is the mean result of the analyses, amounting to three in number: they agreed very tolerably well with each other, considering the nature of the material submitted to analysis:—

Mean Composition of Tubercular Lungs, partly consolidated and partly in a state of softening.

In 200 grammes.

	Tissue proper.	Nutritive Material.	Effete Material.	Mean on 100.	Theory.
Albumen, .	15·72	7·06	2·388		
Phosph. acid,	0·289	0·130	0·276	47·7	43
Potash, .	0·027	0·012	0·302	52·3	57
Soda, . .	(0·052)	(0·023)	0·544 (total)		
Chlorine, .			0·452		

On 200 grammes.

Water, .	165
Fat, .	3·91

The numbers for the phosphoric acid and potash effete in the three analyses were:—

	I.	II.	III.
PO_5, . . .	44·7	46·8	50·8
KO, . . .	55·3	53·2	49·2

It is interesting to observe that, in analysis No. III., where the proportions found are the farthest from those required for the formation of a pyrophosphate, the absolute numbers obtained are much the highest. This is explained by the circumstance that in the sample analyzed, No. III., the phosphoric acid and potash are less crystalloid, and consequently not so diffusible as in the two other samples. These numbers, for the three analyses, are as follows:—

On 200 grammes.

	I.	II.	III.
PO_5, . .	0·220	0·236	0·377
KO, . .	0·272	0·268	0·365

The accumulation of effete phosphoric acid and potash in salmon has been accounted for precisely in the same way.

The analysis of tubercular pulmonary tissue shows, moreover, that its proportions of tissue proper and nutritive material are relatively less than in healthy lungs, this deficiency being made up by the presence of an increase of water and effete or crystalloid material.

One of the most interesting points in connexion with the physical condition of tubercular lungs, is the fact that the state of semi-fluidity in which they are found when undergoing softening, is attended with but a trifling increase (3·5 per cent.) of the quantity of water pulmonary tissue contains in the normal condition. At first sight this appears to be unaccountable, but on a closer consideration it will be explained quite satisfactorily. In health the lungs may be considered as containing water in a perfectly colloid state, indeed much in the same condition as water in a jelly. In the case of tubercular lungs, the colloid attraction of the water for the solid constituents may be considered as lost or much diminished, and the part becomes semi-fluid. As healthy nutrition consists in the fixing of colloid material, it may be readily understood that the present morbid condition is opposed to the formation of healthy tissue.

I have much pleasure in acknowledging the valuable assistance I have had in the analytical part of the present inquiry from Messrs F. A. Manning, H. Bassett, and M. J. Salter.

Conclusions.

The conclusions I have obtained from the present inquiry may be summed up as follows:—

1*st*, Phosphoric acid and potash may be prepared artificially in the colloid state, by dialysing a mixture of chloride of potassium and phosphate of soda.

2*d*, Wheaten flour, potato, and rice are found to contain, respectively, nearly the same proportions of colloid phosphoric acid and colloid potash, compared to the total quantities of these substances present; and these same proportions of phosphoric acid and potash are occasionally found to exist also in blood.

3*d*, Plants form colloid material, although they may find some ready prepared, or in process of preparation in the soil.

4*th*, Muscular tissue in health is formed of three classes of substances:—(1.) Those which constitute the tissue proper; (2.) Those destined to become transformed into the tissue proper, and make up for the waste; (3.) Those which are in process of elimination—the first being solid and colloid, the second fluid and colloid, and the third soluble and crystalloid; the phosphoric acid and potash in the third class of substances occur precisely in the proportion required to form crystalloid pyrophosphate of potash. This is invariably true for the flesh of animals highest in the scale; but in the salmon the proportions do not quite agree with those of the above compound, which appears to show that the material in progress of elimination is somewhat less crystalloid in fishes than in the flesh of the higher animals, and this would account for an accumulation of effete matter in the salmon.

5*th*, Blood-corpuscles appear to take up albumen, phosphoric acid, and potash in the blood, and yield them in the proper proportions to muscular tissue for its nutrition; but this subject requires further investigation.

6*th*, The nutrition of pulmonary tissue in health differs from that of muscular tissue, inasmuch as the proportion of phosphoric acid to the albumen in the tissue proper, and consequently also in the nutritive material, is much higher in the lungs than in flesh; and that of the potash in the effete material is much higher, proportionally, to the phosphoric acid in pulmonary than in muscular tissue. This excess of potash is apparently eliminated under the form of carbonate.

7*th*, The nature of the chemical changes which take place within muscles in consumption is the same as in health, but these changes are lessened in degree, the amount of nutritive material supplied being diminished. Moreover there appears to be in muscular tissue in phthisis a beginning of that separation of water from the solids which, under other circumstances, only occurs some time after death.

8*th*, Muscular tissue in consumption contains more soda and chlorine than in health; in the mean proportion of 0·117 of chlorine and 0·239 of soda in health, to 0·385 of chlorine and 0·446 of soda in consumption, for 200 grammes of flesh; showing apparently that the physical power of diffusion which had been kept in abeyance in health begins to act in phthisis.

9th, The pulmonary tissue in phthisis, when consolidated and softening, still undergoes a process of nutrition; but this phenomenon is different from that which occurs in health, and becomes remarkably like the nutrition of muscular tissue.

10th, The pulpy state of tubercular lungs in the softening condition appears due to an altered relation between the water and solids, and not to a fatty degeneration. The diseased organs, moreover, contain less colloid and more effete or crystalloid material than in health, these several phenomena showing, as in the case of muscles, a commencement of physical change.

11th, Finally, death from consumption, when not due to asphyxia from deficient action of the organs of respiration, is apparently owing to the physical power of matter overcoming the phenomena of life, the nature of which is still a mystery, physical changes actually commencing before life is extinct.

ARTICLE IV.—*Pythogenic Fever in Reykjavik during the Summer of* 1871. By T. HJALTELIN, M.D., Chief Physician of Iceland.

ALLOWING me to give the following description of a malignant fever which last summer raged in our little town, I beg to mention that I am using the word *pythogenic fever* for that kind of typhus to which French writers generally give the name of *fièvre typhoide*, and which in England often goes under the name of *enteric fever*, and which in Germany is called *abdominal typhus*.

Pythogenic fever was, so far as I know, first named so by the eminent and excellent writer on fevers, Dr Charles Murchison, of London; and it is to be regreted that the awkward name of "typhoid fever" is still so much used, although it certainly has no logical or etymological meaning, and may easily be misunderstood by young and inexperienced medical students, or even by young practitioners.

Before describing the chief symptoms of that malignant fever which tormented us, I shall make some few remarks on its antecedents and probable causes, which, according to my conviction, were remarkable and evident enough, and show that this fever sprang from putrid emanations.

The season of our last summer was, for our latitude, uncommonly hot, dry, and calm—the temperature of the three summer months, June, July, and August, being about 8° of Fahrenheit above the mean annual average heat of those months. The season was also uncommonly calm, and the little breeze or gale sometimes occurring was blowing from the sea. Rain seldom fell; and when some showers happened they did not last long, but were followed by clear sky and burning sunshine, the heat of which is the more strongly felt as we have no trees to shelter us.

The atmosphere of our town was at this time not very salubrious.

The breeze, blowing from the seashore, filled our air with odour of rotten seaweed and the emanations from putrid mollusca mixed with the seaweed. Adding to this an enormous number of horses, driven to the town for sale or carrying goods to and from the country, standing in the streets for many hours, and leaving there their excrements and urine, one may easily guess the unhappy hygienic state of the place.

The first cases of the epidemic occurred about the beginning of July, and the fever was at its highest pitch at the end of that month; the most fatal days were those of 23d to 29th of July inclusive.

The following short extract of my daily observations will give the reader an idea of our medical climatology at that time :—

Date. July	Barometer.	Thermometer.	Hygrometer and Wind.	Ozone.
23	29·804	58	Dry—Calm.	Only a trace.
24	29·806	58	Dry—Calm.	No trace.
25	29·564	61	Dry—Calm.	No trace.
26	29·634	64	Dry—Calm.	No trace.
27	29·638	62	Dry—Calm.	No trace.
28	29·982	63	Dry—Calm.	No trace.
29	29·902	58	Dry—Calm.	Small trace.

Just in those days now mentioned, many people fell sick with a continuous fever, vertigo, headache, pains in the limbs, furred tongue, white in the middle, red at the tip and the edges, thirst, irregular abrupt sleep, nausea, want of appetite or total aversion to food, and loss of muscular strength. Some of the patients were constipated; others had wandering pains in the abdomen, and some diarrhœa, with uneasy feelings about the precordia; others had already, on the seventh or eighth day, some pain in the right iliac region by pressure of the hand, but generally it was first about the twelfth or seventeenth day that gurgling was remarked in this place. Some patients thus affected could, in the beginning of their fever, leave their bed, or even walk a little about; but they were all incapable of any serious bodily or mental exertions. Many had, from the beginning, some epistaxis, or a little blood-spitting; but the most of these symptoms were, in the first week, of a mild character, although the irregular chills, alternating with heat and flushing of the face, the loss of appetite, the disturbed interrupted sleep, or more or less continuous sleeplessness, led one to suspect the "anguem sub herba jacentem." Many were, nevertheless, inclined to look upon these first symptoms as slight sufferings, occasioned by dyspepsia or digestive derangements, which would soon be better.

Thus, this fever crept on very insidiously, so that many patients which you, in the beginning of the disease, might look upon as only affected by a slight febricula, were, after fourteen to sixteen days, prostrated, sleepless or delirious, with dilated pupils and lenticular rose-spots about the abdomen, mixed with orbices or petechiæ, both on the trunk and the extremities. Bloody diarrhœa also often set in, and ominous dark-red spots occurred about the nates, which sometimes, in a short time, turned into large and malignant bedsores; in others, the bloody diarrhœa became very profuse, and some of them succumbed from mere exhaustion.

The heat of the body was, without exception, very great from the beginning of the fever, and the thermometer applied under the tongue showed from 104 to 106 degrees of Fahrenheit. The fever and the heat were always augmented towards the evenings, and even to that degree that there would be a difference of twenty beats more per minute in the evening pulse compared with that of the morning hours. The danger of every case was evidently parallel to the augmentation of the burning heat (*calor mordax*) of the body, and the steady quickness of the pulse. Deafness was a very well-marked symptom, nearly in all cases, but it came on at very different periods. Sometimes it was first remarked in the second week, or little before the defervescence; at other times, it was a precursory sign for the approaching reconvalescence. In all cases where sulphate of quinia had been administered, it was most remarked. I have never found this a constant bad symptom, neither in typhus nor in pythogenic fever; and I remember still that I, in my younger days, heard it spoken of by some eminent German physicians as a rather favourable than dangerous symptom in all malignant fevers. But be this as it may, it was often absent in the most dangerous cases of this fever, except in one where it was present about a week before death.

The latter, or malignant stage of this fever, was always marked by great prostration, dry and brownish tongue, low and continuous delirium, involuntary evacuations of urine and fæces, stupor, profuse bloody diarrhœa, collapsed face, and, in two fatal cases, with carbuncle-like black crusted boils, with a darkened halo on the extremities. Those boils, which I sometimes also have seen in the worst and most dangerous cases of exanthematic typhus, are undeniable instances of the great likeness between the most malignant forms of typhus and pythogenic fever, and the Oriental plague itself.

The hæmorrhagic form also showed a great deal of malignity, and was extremely dangerous. In some of the patients affected by this form, the blood was in shorter or longer intervals continually dropping, not only from the nose, but also from the tonsils and the buccal cavity; nevertheless, some of these recovered after the use of a strong infusion of galls.

Spasmodic movements—viz., carphology, hiccup, and subsultus tendinum—were often occurring, even in those cases that got well; wakefulness and coma-vigil was also a most frequent symptom in the earlier stages.

Somnolence and stupor were, in a few cases, so profound, that some patients, when in convalescence, had no notion or remembrance of their state during the whole disease. Few patients passed through this fever without more or less severe delirium; but this delirium was seldom so maniacal as is often the case in true exanthematic typhus fever.

Retention of the urine was rare, and far more so than in exanthematic typhus; but the incontinence of urine was, on the contrary, more common. In the beginning of the fever the urine was much diminished in quantity, with strong acid reaction, but in the latter stage it became more clear, depositing phosphates in great quantity. The stools were for the most part of an ochre or dark yellow colour, sometimes quite dark, with the most offensive odour. Meteorism also occurred, but not so often as might have been supposed in this malignant fever; it occurred most frequently in young persons, but was generally relieved either by turpentine fomentations all over the abdomen, or by cold-water clysmata, with a few minims of diluted carbolic acid.

Bronchitis and pneumonia were happily enough amongst the rarer complications in this fever, but whensoever they occurred they were most dangerous, leading quickly to hypostatic consolidation of the lungs.

The respiration was in all cases more or less hurried, and often mounted to thirty-two inspirations in the minute, and sometimes far more, especially in the fatal cases.

In most cases the fever lasted from three to five weeks, but in some the convalescence began about the fourteenth day; the death occurred always in the later stages, and some that were lost died at the end of the fourth week; they all died of exhaustion, unrelieved or unaffected either by stimulants—such as alcohol, ether, musk, quinia, and wine—or by a nourishing diet—such as milk, beef-tea, and extractum carnis of Liebig, etc. The exhaustion was, in most cases, occasioned by hæmorrhage, not yielding to any remedy, but sometimes lessened by a strong infusion of galls. Perforation or peritonitis never occurred, but the chief danger seemed to arise from a specific dissolution of the blood-corpuscles, or perhaps, more correctly, from the rotten or putrid state of the blood, with more or less exhaustion of the heart's action. The fever generally rose very high during the first week, or after eight days; and I remember a young student who, no doubt by great mental exertions, had overworked his brain, in whom the pulse nearly constantly was beating from 120 to 130 beats in the minute during twenty-six days. Only after some sleep produced by hydrate of chloral the pulse fell during the forenoon to 100, but it soon got quicker towards evening, and continued at its fatal height until the agony set in.

The convalescence was often slow, and the patients were very much emaciated for a long time. This emaciation began in the second week, and was for the most part followed by weakness and irregular contractions of the heart. Milk diet and beef-tea, even taken in no small quantity, could not prevent this, and stimulants had no power over it.

This fever was especially frequent in young people, and more than thirty of the affected had not reached their thirtieth year. Sixteen were between thirty and forty, two were more than forty, one about fifty, and one between fifty and sixty. Of children between one and ten years there were about ten, and in them the fever did not last so long as in the adult. It attacked one sex as readily as the other, nearly half the number of the sick being females; but it seemed more dangerous for males than females, and more were lost of the former. Out of both sexes the mortality was equal to 14 per cent. The most dangerous cases were those which had commenced between the 23d and 30th of July, or, as aforementioned, during the most hot and calm weather, when either small or no trace of ozone could be found in the atmosphere. About this time many people who walked about, or were at their usual work, complained of headache, loss of appetite, interrupted sleep, unusual thirst, constipation, or diarrhœa alternating with constipation, and some other well-known precursory symptoms of the pythogenic fever. One very active young man, the sheriff of the surrounding parishes, told me that he found himself very much indisposed when he was in town, but that his indisposition disappeared when he took a long ride on horseback, or was altogether absent from the town. Some people ascribed this indisposition to the summer heat, but I felt convinced that it was occasioned by the same bad atmospheric constitution, which was most strongly felt in our little town. To all people thus affected I ordered a strong dose of calomel combined with rhubarb or a little podophyllin, and I feel convinced that it cut the disease short in many cases, as it also was clear enough that the ominous pressing feelings about the precordia and the irregular state of the alvine evacuations were cured by it. The abortive typhus of the most excellent Prof. Hermann Lebert of Berlin is certainly no fiction, but a real morbid state of the body, and I quite agree with his opinions as to the impossibility of distinguishing between the exanthematic and enteric typhus in such cases.[1] How many there were thus affected I cannot tell, for I had no time to register them, but I remember very well that there were a great many. From those facts, and many other circumstances, it was, in my opinion, quite evident that this fever arose from some deleterious poisonous matter or microzymes floating in the atmosphere, and I could in some houses remark an offensive odour. The sewer system in our little town is still very incomplete, and the inconveniences and dangers of that must, of course, be very seriously felt in the hot and burning sunshine, where no shadowing trees exist to mitigate such a thing.

As to the treatment of this pythogenic fever I may make the following remarks:—

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[1] The words of Lebert run thus:—"Eine zu scharfe ontologische abgrenzung zwischen ileo-typhus, und exanthematischen typhus, is durchaus nich möglich."—Dr Hermann Lebert's Handbuch der Practischen Medicine. Tübingen, 1863. 1 band, page 114.

When the epidemic was at its height, I was rather much occupied in a quite different direction, for I was obliged to spend a good deal of my time in our national assembly, of which I had been nominated as a member by His Majesty our gracious King. The treatment of this fever was therefore to a great deal conducted by a young but very able colleague of mine, Dr Jóneisson, who for the most part was using the general treatment now in vogue at the hospitals of Copenhagen. This treatment is for this fever an expectant and symptomatic one, consisting in an antifebrile diet, with laxative of castor-oil, diluted sulphuric acid, or the so-called mistura acida sulphurica of the Danish Pharmacopœia, consisting of three parts of acidum sulphuricum dilutum, with one hundred of water and twenty-two of a sweet syrup, and sometimes mixed with a few grains of bisulphate of quinia. This drug was given in a half-ounce dose every second hour. When diarrhœa set in, mucilago arabica was administered, either alone or mixed with decoction of cinchona or calumba, in about the same dose as the forenamed sulphuric mixture. Cold epithems were applied to the head, and a current of fresh air was allowed to flow into the sick-room through an open window near the bed. This is the general treatment of enteric fever in the hospitals of Copenhagen, and so it also was here. As I in the meantime am a little doubtful about any decided good effect of sulphuric acid in pythogenic fever, and regarding real disinfectant or antiseptic remedies as the most available ones in this fever, I determined to try some one or other of them, and having recently seen the most decided effect from sulphurous acid, in a most malignant case of confluent smallpox, and also in two cases of enteric typhus, I prescribed that acid in some malignant cases. My hesitation in using it from the beginning of the epidemic arose from a certain fear of deteriorating the air in the small rooms, but as I only intended to use it internally, and not, or at least very seldom, as a fumigation, I was sure it could not really have any serious consequences. I had, moreover, just read some articles on its use in enteric typhus, written by Dr Robert Hamilton, as mentioned in Dr Dobell's Reports for the year 1869, and another still more extensive and encouraging, written by Dr G. Wilks, of Ashford, and printed in the *British Medical Journal* last year, No. 518. It was, moreover, clear to me, from a chemical point of view, that this deoxygenant chemical compound must be far more active in zymotic diseases than the sulphuric acid itself. It is a true and strong antiseptic remedy; it lowers animal heat, as may be shown by direct experiments; it destroys parasitic life, both vegetable and animal; and by its strong attraction for oxygen it prevents putrefaction. By man it can be taken without any remarkable derangement of the health, even to that extent that its odour is given up by the body without further inconvenience. The trials I made with this compound in several malignant cases of pythogenic fever were evidently encouraging, and the effect upon the system was far more clear and evident than is afforded by the diluted sulphuric acid; and not only was the pulse reduced by its use, but the temperature of the body fell also from two to three degrees of Fahrenheit. This lowering of the temperature had, of course, the most beneficial effect on the patients; the wandering pains in the limbs got mitigated, thirst was quenched, and the patients felt in every respect better. This was a constant effect of the sulphurous acid given in the dose of one-half to one drachm every third hour; but notwithstanding this undeniable good effect of this drug, when it was given early in this fever, I never saw it cut this fever short, although it evidently mitigated it very much, and, so far as I could see, deprived it of its danger. Not a single patient who took the sulphurous acid from the beginning of the fever died, or got any serious bed-sores, but went through the fever in about from twelve to eighteen days. When this remedy was first given in the later stages, it had a far less marked effect on the system. It had then probably not time enough, or came too late, in order to prevent the advanced putrid state of the blood, which by that time had propagated its destructive work over the whole system, and produced those morbid changes which anatomical pathologists regard as the true essence of this fever, but which in reality are the "caput mortuum" of the still little-known biochemical changes going on from the beginning of this and so many other zymotic diseases. Let the noble science of animal physiological chemistry first accomplish its grand work, and a great deal of our pathological collections will have little more signification than the well-known "caput mortuum" of the alchemists. But as we are far from that time, pathological preparations will probably still, for many, many years, be our necessary guide in the arduous art of medical science.

According to my experience, the treatment of malignant typhus and pythogenic fever ought always to begin by clearing out the bowels, and I know of no remedy more fit for that purpose than calomel. It ought to be given as early as possible, as it will then most relieve the portal system, and prevent, or at least mitigate, lienal and hepatic congestions, always more or less well marked in the beginning of enteric fever. Podophyllin has no doubt some specific action, not only on the liver, but most likely also upon the whole abdominal glandular system, and I have seen a very good effect from this remedy given in small doses against precordial pressure. Immediately after the aperient remedies, sulphurous acid mixed with pure water is the best remedy, according to my experience, at least in a pythogenic fever like that I had to deal with last summer. In cases of true, well-marked exanthematic typhus, I would rather trust to iodoform, chlorine water, or some other oxygenizing compounds, for in that disease I have many a time seen the best effect from them. The preference for diluted sulphuric acid in both those fevers, instead of sulphurous acid, can neither be founded on chemical nor practical principles.

Another remedy of which I often made use in this fever was chloral hydrate. From an article in the *British Medical Journal*, 30th April 1870, I learned that it had been tried in the Royal Infirmary of Edinburgh; and as I have the honour of personally knowing some of the excellent physicians to that hospital, this article was a strong inducement to me to give it a fair trial, especially in some cases of great restlessness or long-standing sleeplessness; but although I found the effect of this remedy exactly as it is delineated in the said article, it failed in one case where it was given a second and third time; perhaps for this reason, that it had been discontinued for some days after its first very remarkable effect of producing a profound and long-lasting sleep. In some cases I found it more efficacious when it was combined with a small quantity of muriate of morphia.

REYKJAVIK, 10*th November* 1871.

ARTICLE V.—*On the Sanitary Aspect of the Sewage Question; with Remarks on a little-noticed Cause of Typhoid Fever, and other Zymotics.* By ANDREW FERGUS, M.D., etc., Glasgow.

(*Read before the Medico-Chirurgical Society of Edinburgh*, 17*th January*.)

I BEGAN the study of this question long ago, with a mind thoroughly unprejudiced on the subject. The longer I study the matter, and the more I read, I become more and more convinced that our present system of water-carriage is a mistake, and was begun in ignorance of the results that would flow from it. It is, moreover, very wasteful, and highly deleterious to public health. I hold with Lord Palmerston that "dirt is merely useful matter in a wrong place," and that, if we would only observe the economy of nature, we would find there is no loss, no such thing as waste; but that, on the contrary, what is superfluous in one order of organized nature is food for another.

Thus, we see that the secretions given off by animals involuntarily are utilized; as, for example, the carbonic acid given out so abundantly by animals is absorbed by plants. Some secretions, however, are left under our own control, and in the disposal of these we experience great difficulty, simply, as I believe, because we do not adopt the method pointed out to us by nature. Earth being the original parent, everything taken from it should be restored to it again—the true rotation is, from earth to plants, from plants to animals, and from animals back to the earth again. We have not followed this rotation of nature, and hence all our difficulties have arisen.

Those excretions which have a high commercial value, and would materially assist in enriching our land, we have passed into our rivers and streams, rendering these in many places nothing better than cesspools.

I adduce in proof of this, the condition of three rivers—the Thames, the Tyne, and the Clyde. On both banks of the Tyne there are a vast number of chemical works; I am told that 45 per cent. of all the alkali made in Britain is manufactured there, and that the manufacturers are in the habit of passing the refuse matter into the river in a much more acid state than elsewhere; yet, three years ago, I saw salmon passing quite freely to the upper reaches of the river.

In 1847, an Act was passed compelling all the privies, etc., of London to be drained into the river, and we all know how soon it became foul. On the Clyde we have plenty of chemical works, but in Glasgow alone about 32,500 water-closets; and I think it is a fair inference to deduce, that these are the chief causes of the pollution of the river. Salmon passed freely up until the rapid introduction of water-closets.

All organic matter, *i.e.*, matter capable of putrefaction, is injurious. I shall only give one instance of this sort of nuisance, viz., pot ale from distilleries. Mr Smith tells me that from one of these distilleries there are 500,000 gallons per week, each tun of which contains organic matter to the value of 3s. 6d. a tun. Now, if a law was passed, excluding all organic matter or refuse from the sewers, it would compel the proprietor of this distillery to make a large revenue from what he now wastes, and by which he creates a nuisance.

The question arises, Is the condition of rivers, when loaded with organic refuse in a state of putrefaction, injurious to health? Bad as they are, and utterly shocking in an æsthetic point of view in summer, I really do not think that they are so. The question has been often discussed, but I have never yet heard anything going to prove that rivers in this state were hurtful to health, neither do we find that the diseases which proceed from excremental pollution prevail in the neighbourhood of rivers which are thus befouled. I should like this to be distinctly and clearly borne in mind by those gentlemen who take an interest in sanitary matters, because if they look merely to the purification of rivers, the result will be unsatisfactory, inasmuch as though the rivers *were* rendered quite pure, there would be no gain as regards the health of the community. I hold, that if we wish to purify our rivers, diminish the death-rate, and improve the health of the water-closet towns, we must stop the decomposition of excreta and other organic matters in the sewers, from which gases capable of producing disease arise.

Fresh excreta are not injurious to health, it is only when they decompose that they are so; and the most favourable circumstances to facilitate this are, that they should be placed in narrow passages, with a limited supply of air and water.

In a word, our cesspools and sewers are ingeniously-contrived chemical laboratories for the production of sewer-gas.

I wish I could bring to the surface, and exhibit to you in all their hideousness, the sewers of any large city. We should find them of great variety, viz., old water-courses arched over; and the sewers, some circular, some oval, and, I fear, still some square. At the bottom of most of them we should find a thick, blackish, tenacious mud, and flowing over it a dirty, sluggish stream, slowly, silently, yet continually giving out sewer-gas. Sinking the sewers to their unsightly bed, let us look at the manner in which they are connected with our houses by water-closets more or less out of repair, and more or less imperfect, some of them being merely pipes, with no pretence of a pan, passing directly into the sewers, and thus becoming a source of danger. Another source is by means of fixed basins or sinks, some of them in our bedrooms, and within a few feet of our beds.[1]

I may be told, perhaps, to trap and ventilate the sewers, but, of course, if we trap in one place we but leave more to escape in another; in fact, this would only be to exclude a poisonous gas from our own houses that might find its way into our neighbour's, who, perhaps, might not be so well protected. Ventilation is not easy, and is very costly. Mr Bazalgette estimates that the ventilation of the sewers in London would cost £460,000, with an additional annual expense of £201,480 for fuel, exclusive of labour; flushing with water would cost £381,250.[2]

Supposing that we have trapped our sewers, and carried a ventilating pipe to the roof, we have not destroyed the poison, but merely diluted it. Instead of passing into our houses, it passes over them, and must have an injurious and lowering influence on the health of the surrounding inhabitants, the air being thus more or less contaminated.[3]

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[1] When talking over this subject with the late Sir James Simpson, he told me of a row of houses which, by way of being *improved* (?), had sinks placed in them. Typhoid fever had up to that time been unknown in these houses, but very soon afterwards it broke out, and passed through the whole range.

[2] More than three years ago, I made a proposal to ventilate the sewers of Glasgow, by having them connected with the furnaces of some of the numerous public works in that city, which could have been done with very little cost.

[3] To show how slight a contamination of air will produce disease, allow me to mention a case which came under my own observation a few weeks ago. A youth was fishing for, and caught two trout; fourteen days afterwards (period of incubation) symptoms of typhoid fever appeared. His father, a most observant and intelligent medical man, remembered that a sewer, entering the stream near where his son had been fishing, had been opened for repair at the time; therefore, although the sewerage was not strong enough to kill the trout, the atmosphere was so tainted that its inhalation produced typhoid fever. I made particular inquiry into this case, and found that the youth had not drunk any of the water of the stream; neither, so far as was known, had he been in any other way exposed to the result of excremental pollution.

This sewage gas is always being formed, is generally lighter than air, and frequently hotter. It follows that it must often be in a state of tension, that it will ascend, and, if possible, escape at the highest point. When it does so into the streets, if the outside temperature is very low, we shall see the watery vapour condensed like steam.

Many people rush quickly past these sewer gratings in a cold winter day to avoid the pestilential vapour, and greatly pitying the poor people who are obliged to live in such a neighbourhood; never suspecting that the very same vapour may be entering their own houses, although invisibly, owing to the higher temperature within.

It may be asked, How can this gas get into our houses if the water-closets are in perfect working order, and the drains in good condition and well trapped? I answer, that it is not easy to trap the drains thoroughly. People imagine that if they have a few inches of water in a bent tube, dignified by the term "syphon trap," that no air can pass into their houses from the sewers; and certainly there will not, so long as the pressure is equal on both sides of the water in the bent tube. But if rain rapidly fills the drain with water, or if the drains open into a tidal river, at the time of high water there is a great pressure on the air in the sewer, and it forces its way into our houses through any trap that has yet been invented. The gas being in a state of tension will escape as the barometer falls. In familiar illustration of this, we sometimes hear people predicting rain from perceiving a disagreeable odour; and correctly so—the falling atmospheric pressure being the precursor of rain as well as the liberator of the sewer-gas.

This contamination of air in sewers will vary in different localities and at different seasons of the year. Generally the amount of oxygen is diminished; and we find as impurities in air from sewers —carbonic acid, light carburetted hydrogen, sulphuretted hydrogen, and fœtid organic matter, which last is probably the principal cause of the extreme unhealthiness of sewer air. At the Sewage Conference at Leamington, one of the most philosophical physicians (Dr Benjamin Richardson) gave a list of fifteen diseases that may all pass from, or be conveyed by, sewage.[1]

When we look back to the epidemics of the middle ages and some centuries ago, we readily acknowledge that, if they were not directly caused, they were enormously aggravated, by the habits of the people. If any of these epidemics reappear, why should we not attribute it to the same cause? We are given to congratulating ourselves on having, by our improved sanitary arrangements, got quit of the plague, sweating sickness, etc., etc.; but if some bypast and long latent epidemic reappears, why should we not look to the same cause as before as its probable generator? or why should we not inquire if some of our present and most fatal epidemics may not be produced by, or owe their intensity to, a similar origin?[1]

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[1] Dr Richardson's Table of Diseases from Organic Poisons :—"The diseases which may be produced by the organic poisons are as follows:—Smallpox, measles, scarlet fever, diphtheria, typhus fever, typhoid fever, erysipelas, hospital fever, puerperal fever, cholera, yellow fever, ague, glanders, boil and carbuncle, infectious ophthalmia. This is a long list of diseases, amounting to fifteen in number, mainly traceable to the poisons which, as I have said, may pass from the sewage."

Mr Simon very pertinently asks why diphtheria, which scarcely had a place in history till it overran Europe in the sixteenth century, and which since then has scarcely been spoken of, should recently have become an important disease in England?[2]

The answer to Mr Simon's question is simply this:—We have been careless in the disposal of our excretions, and have been drinking water or breathing air contaminated with excretal matter in a state of decomposition. For details proving this, as regards outbreaks of diphtheria, I refer to the Second Report of the Medical Officer of the Privy Council—see pages 167, 168, 171, 172; and in the Eighth Report, page 251. Typhoid fever, killing in England 15,000 to 18,000 people annually, is another disease resulting from excremental pollution.

All modern investigators agree in this; and there is seldom a week but in one or other of the medical journals we do not find an account of some outbreak of zymotic disease from excremental pollution.

In the last Report of the Medical Officer to the Privy Council, published a few months ago, I find a table of the places visited by the Inspectors owing to increased death-rates. The total number of places so visited is 66; but 6 of these being double entries, reduces the number to 60; and in 50 of these the increased death-rate was traced to excremental pollution, producing typhoid fever in 49 and scarlet fever in 16 of these infected places.

In most of these cases the water was befouled; but as this is so well known as a cause of disease, and has been so amply proved, I shall not dwell upon it, but rather enter somewhat more in detail on another source of typhoid and other zymotic diseases which is not so well known, and cannot so easily be guarded against.

About fifteen years ago I first detected perforated soil-pipes. At first I merely looked upon them as a nuisance, because offensive, and did not connect them with disease; neither did I then know how these perforations were produced.

In the first pipes I inspected, as the perforations were on the upper side, I imagined that pieces of lime might have dropped down on the pipes and eaten their way through. This opinion I abandoned, as I found the perforations were from within. I also found that they were generally on the upper surface of the pipe, and that, therefore, the destruction could not be caused by fluid conveyed through it. I also observed that the pipe usually affected in this manner was the cross one, leading from the closet to the main descending soil-pipe; and that if there was a bend or arch in the pipe, the upper surface of the bend or arch would become perforated. Another element to be taken into consideration is, that these perforations are most frequently found in the upper flats of houses, and, occasionally, in the sides of the descending soil-pipes.

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[1] It may be mentioned here that cholera did not prevail in this country till after the adoption of water-closets; neither had diphtheria been epidemic for 200 years till we adopted this system.

[2] I append a table. from which you will perceive that there are no deaths till 1851; in that year there were only 40, and till 1857 the numbers varied from that to 310. It then suddenly increased—reaching its maximum, 9587, in 1859. The total deaths till 1868 are 54,872.

The question now arises, How is this destruction of good well-made lead pipes effected?

If we remember the position of this destructive action in the pipes, and take into consideration the results of chemical analysis,[1] as well as the increased rapidity with which this action takes place in pipes that are not ventilated, I think we are justified in coming to the conclusion that these results are owing to the action of sewer-gas. If you will carefully notice the specimens you will perceive that the destructive action is from within, and that in some places the pipes are more or less corroded even where the action has not gone the length of complete perforation (fig. 5).

Of course, my own discovery of such pipes in houses has only been where I have been attending professionally, and where the diseases were of such a type as are known to be produced by breathing the results of the decomposition of excreta. The diseases I have observed as resulting from this state of pipes are typhoid fever, diphtheria, scarlet fever, diarrhœa, etc.; and in one or two cases I have had to order the removal of families who were suffering from ill-health from this poison, without exhibiting symptoms of any well-defined disease. As the investigation of the causation of disease is carried out, I believe that the list already given of those diseases produced or conveyed by sewage will be increased. In two cases of phthisis in people long past middle life, I could not attribute the disease to any other cause. The family history was good, the mode of living correct, and the general health satisfactory up to the time of the soil-pipes becoming corroded (fig. 3).

About three years ago I was asked to visit the child of the super-

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[1] By Mr Stamford's kind permission, I am enabled to give the analysis of the inner coating of these pipes:—

Carbonate of lead, . .	2·70	86·00	91·00	92·90
Carbonate of lime, . .	80·63	2·50	2·10	2·90
Water, ...	0·45	1·20	1·00	0·50
Lead insoluble as oxide, .	—	3·50	1·50	1·45
Silica, ...	1·35	2·80	1·00	1·60
Organic matter, . . .	14·87	4·00	3·40	0·65
	100·00	100·00	100·00	100·00

The analysis No. 1 indicates that probably chloride of lime had recently been used to destroy the effluvia from the already perforated pipes.

intendent of a large public institution. I at once suspected typhoid fever, which proved to be the case. I was, moreover, told that it had twice already been in this gentleman's family; and that the year before the whole family had suffered from diphtheria. On making inquiry as to the state of the drainage, water-supply, etc., I was told that the water was Loch Katrine, and so beyond suspicion. The master of works for the institution was a most intelligent man, who had paid special attention to the drainage. He had soil-pipes with extra depth of traps, indeed the deepest I have seen, and it was difficult to account for the manner of infection, the pipes being pronounced free from any defect; but, in a short time, another child was seized, as well as several of the officials of the institution. In passing a particular spot in the superintendent's house, however, I perceived a faint odour of sewer-gas; and, on mentioning this to him, he most promptly had the pipes uncovered, and perforations were at once discovered in the vertical soil-pipe.[1] This led to a complete overhaul of all the pipes in the house, and the removal of those that were defective; and since then I have not heard of a single case of typhoid or diphtheria in the establishment. Plumbers do not readily detect this defective state of pipes, as they look for a liquid leakage. Some time ago, in visting a case of typhoid, I asked the mother of my patient as to the state of the closet and pipes. She replied, "Oh, Doctor, you are wrong this time; all these things were renewed only two months ago." Of course I was extinguished; but still ventured to inquire what might be the cause of a very perceptible, and by no means agreeable, odour. A dead rat was suggested as its possible origin. However, as it was no matter to trifle with, I requested that the plumber might be sent for, and also that he should be told that the soil-pipe close to the cross-pipe was eaten away (fig. 6).

At my next visit, the lady told me that the plumber had been very much astonished to find the pipe exactly in the state I had predicted. I now exhibit the pipe. I have been told that this state of pipes must be peculiar to Glasgow, and must be produced by some chemicals getting into the sewers; but I have made many inquiries, and find the same thing existing in every water-closet town in reference to which I have had information. This, the worst specimen on the table, is from Edinburgh, where there are few chemical works (fig. 6). Lead has generally been used as the material for soil-pipes, and as we have seen how capable it is of corrosion, it becomes a very important sanitary question to inquire how long a good lead soil-pipe will hold out. I have been studying this question for several years, and it is now about five since I first exhibited pipes in public, yet I would not wish to dogmatize on the subject, but rather give approximations, and would remark that the time will vary under the various circumstances according to the strength and rapidity of flow of the sewage, as well as the original thickness of the pipe. But after allowing for this, we must broadly distinguish between soil-pipes which are ventilated and those which are not. By the former I mean when the pipe is carried up to the roof of the house and open to the external air; by the latter I mean when the pipes are closed up. Of these last mentioned, the duration may be stated to be about twelve years, the extremes of variation being from a minimum of eight to a maximum of twenty years.

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[1] I would by no means be understood to say that smell, merely as such, produces disease; it is simply a quality of what in this case does so.

In ventilated pipes the duration may be stated to be nearly double, running from twenty-one to twenty-three years, the extremes of variation being from eighteen to thirty or even more years. The practical sanitary conclusion which it concerns us all to keep in mind is, that any house, no matter how carefully and well built, may become unhealthy from this source, and that when cases of typhoid fever, diphtheria, etc., occur, the pipes should be thoroughly inspected—especially their upper surface—and the whole of the soil-pipe uncovered.

I must strongly insist on this, as in many cases the plumbers have declared the pipes to be all right, which turned out to be very defective when uncovered. For some years back, I have insisted on a careful examination of the soil-pipes wherever I have cases of typhoid or diphtheria, and in every case where I could get this carefully carried out, I have detected these perforated pipes.[1]

What first led me to connect this state of soil-pipes with disease was the fact that, as regards water-supply, Glasgow should not be exposed to diseases resulting from excremental pollution; and if we have these diseases, we must attribute them to some other source.

Another way in which sewer-gas may act injuriously, is by its passing up the waste-pipe of the cistern, and becoming absorbed by the water. In houses that have been shut up for a few months, this should be guarded against by running off all the water, and clearing out the mud at the bottom of the cistern, before the houses are re-inhabited. I also propose to insert into the waste-pipe a long wire cage with a circular head, and to keep this filled with seaweed or other charcoal, which should be replenished from time to time (fig. 4). Of course it would be much better if all water used for cooking or drinking were drawn direct from the main.

It would prolong the duration of the pipe, and be an important sanitary improvement, if the soil-pipes were in every case carried up to the roof, and left quite open to the air. The expense of this would be more than compensated to the landlords by the greatly-increased duration of the lead pipes.

Another group of diseases arising from excremental pollution are the diarrhœal, including cholera. I need not, I think, insist that this last disease is the direct consequence of taking into our system the results of excremental pollution. Instead of going into any proof of my own as to this, I shall quote from the admirable and vigorous language of Mr Simon. In the Eighth Report, page 39, he thus writes:—"When cholera is epidemic in any place, persons who are suffering from the epidemic influence, though perhaps with only the slightest degree of diarrhœa, may, if they migrate, be the means of conveying to other places an infection of indefinite severity; but the quality of infectiveness belongs particularly, if not exclusively, to the matters which the patient discharges by purging and vomiting from his intestinal canal; that these matters are comparatively non-infective at the moment when they are discharged, but subsequently, while undergoing decomposition, acquire their maximum of infective power; that choleraic discharges, if cast away without previous disinfection, impart their own infective quality to the excremental matters with which they mingle in drains or cesspools, or wherever else they flow or soak, and to the effluvia which these matters evolve; that if the cholera contagium, by leakage or soakage from drains or cesspools, or otherwise, get access, even in small quantity, to wells or other sources of drinking water, it infects in the most dangerous manner very large volumes of the fluid; that in the above described ways, even a single patient with slight choleraic diarrhœa may exert a powerful infective influence on masses of population, among whom, perhaps, his presence is unsuspected; that things such as bedding and clothing, which have been imbued with choleraic discharges, and not afterwards fully disinfected, may long retain their infectious properties, and be the means of exciting choleraic outbreaks wherever they are sent for washing or other purposes."

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[1] Except in one case, where the patient had only returned a few days previously from the country, and where I found, from making inquiry, that the water in the country house was impure.

Again, in Report Ninth, pages 33 and 34, Mr Simon thus powerfully writes:—"It cannot be too distinctly understood, that the person who contracts cholera in this country is, *ipso facto*, demonstrated with almost absolute certainty to have been exposed to excremental pollution; that what gave him cholera was (mediately or immediately) cholera-contagium—discharged from another's bowels; that, in short, the diffusion of cholera among us depends entirely upon the numberless filthy facilities which are let exist, and specially in our larger towns, for the fouling of earth, and air, and water, and thus secondarily for the infection of man, with whatever contagium may be contained in the miscellaneous outflowings of the population. Excrement-sodden earth, excrement-reeking air, excrement-tainted water—these are for us the causes of cholera. That they respectively act only in so far as the excrement is cholera-excrement, and that cholera-excrement again only acts in so far as it contains certain microscopical fungi, may be the truest of all propositions; but whatever be their abstract truth, their separate application is impossible. Nowhere out of Laputa could there be serious thought of differentiating excremental performances into groups of diarrhœal and healthy, or of using the highest powers of the microscope to identify the cylindro-tænium for extermination. It is excrement indiscriminately, which must be kept from fouling us with its decay.

"The local conditions of safety are, above all, these two—(1) that, by appropriate structural works, all the excremental produce of the population shall be so promptly and so thoroughly removed, that the inhabited place, in its air and soil, shall be absolutely without fæcal impurities; and (2) that the water-supply of the population shall be derived from such sources, and conveyed in such channels, that its contamination by excrement is impossible."

"It is to be hoped that, as the education of the country advances, this sort of thing will come to an end; that so much preventable death will not be always accepted as a fate; that for a population to be thus poisoned by its own excrement, will some day be deemed ignominious and intolerable."

As regards diarrhœa, Dr Greenhow reports, and Mr Simon endorses his opinion, that the deaths from this cause vary from 4 in every 100,000 of the population, to 663 in the same number. He calculates that if the diarrhœal death-rate could be restricted in the whole of England to ten times the minimum death-rate of 4, there would be a saving of 20,000 lives annually, and there would be a great reduction in the deaths from typhoid fever also. Both Mr Simon and Dr Greenhow are of opinion, that the excess of mortality from these diseases has in all places been coincident with one or other of two definite local circumstances: (*a*) the tainting of the atmosphere with the products of organic decomposition, especially of human excrement; or (*b*) the habitual drinking of impure water.

Before turning our attention to remedial measures, allow me to remark, that water-carriage was adopted in ignorance of the results that would flow from it. It was known that water and air oxidize excreta, and it was supposed that we had nothing more to do than merely to pass these matters into streams to be rid of them. The result has amply proved that no river in the kingdom can oxidize the excreta of the towns on its banks. We have had our rivers rendered gigantic cesspools; and though many schemes have been proposed for the treatment of sewage, most of them have failed when brought to the touchstone of scientific research.

The plan of sewage irrigation has many advocates, and therefore I shall offer a few remarks upon it. No doubt it would in some degree utilize the sewage, but it would not in the least improve the sanitary condition of water-closet towns. Its advocates assert that it will carry the excreta *fresh* to the soil, in refutation of which I shall simply advert to the case of Croydon.

I do so, *first*, Because it is a very perfect specimen of sewage works carefully carried out under the most favourable circumstances; *second*, Because the advocates of sewage irrigation insist that the excreta ought to be carried *fresh* to the soil; and, *third*, Because the engineer tells us that the time from the closet, through the drains, through the straining-beds, and out again into the river, varies from a minimum of four to a maximum of six hours.

If this is correct, it follows that at Croydon there should be no gas, it being a well-known fact that excreta take at least twenty-four hours to decompose and give off gas.[1] At Croydon, then, there should be no need of sewer ventilation, yet Dr Carpenter, who highly approves of the system pursued there, tells us that from some mal-arrangement of the pipes in his house, sewage-gas passed into it, with a force resembling the escape of steam, and produced typhoid. As recently as the 6th of this month (January), I see there is a letter from him in the *British Medical Journal*, giving an account of an admirable method adopted in Croydon to destroy sewer-gas by charcoal. From this it is evident, 1*st*, that the excreta are *not* passed on fresh to the land; 2*d*, that it must take much longer than the theoretical time to pass from the closet, through the pipes, and over the meadows. I suppose the mistake may have in part originated in supposing that sewage matter will flow as rapidly through pipes as pure water; but if we have sewer-gases at Croydon, with its recently and admirably constructed sewers, and their favourable fall, what would we have if we attempted sewage irrigation in towns less favourably situated, where the drains are not nearly so well constructed, far more numerous and complicated, and where we might find it necessary to pump the sewage? Another objection to sewage irrigation is, that if the sewage is pumped, in all probability the liquid will be pumped up and the gas left. This was confirmed by the results of drainage works in twenty-five towns in England. In nine of them there was a reduction of more than 50 per cent. in the cases of typhoid; in ten, a reduction of from one-half to one-third per cent.; while in four, there was either a slight decrease or an absolute increase. In these four, the sewage was pumped. It was quite expected that as drainage works were carried out there would be a diminution in zymotics, but experience proves that it has also a favourable influence as regards phthisis. In fifteen towns there was a reduction of deaths from this source of from 49 to 11 per cent. No large city has yet adopted the process of irrigation for the whole of its sewage, and in places where it has been adopted the Birmingham Report complains that it is very difficult to get an account of the financial results.—(Birmingham Report, p. 69.)

The latest estimate allows one acre for every 20 to 30 of the population, and at such a rate you can easily calculate how many acres a city like this would require. To meet this difficulty, intermittent downward filtration has been proposed; but as by it the greater part of the manurial value is lost, I shall not enter upon it.

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[1] I wish it to be understood, that I do not speak as to the present state of Croydon; I am dealing with a much larger subject, and merely quote Croydon as an illustration in point. I make this remark, because when I used it on a former occasion I was misunderstood, and told that because Croydon is healthy now, I had no right to refer to it.

The most fatal objection to irrigation, and indeed every other scheme for the treatment of sewage, is that they do not meet the sanitary difficulty. Before the sewage is taken to the land or submitted to any of the numberless patent schemes, the whole mischief has been done, while experience has also amply proved, in regard to water-carriage, that no river in the kingdom can oxidize the excreta from the towns on its banks. Our engineers stick to water-carriage, however, with a tenacity which is most surprising,—simply, I suppose, because they are engineers, and do not know, or will not study, the other aspect of the question; yet, Mr Hawksley (Birmingham Report) says, that while the art of removing excremental refuse in water has been brought to perfection, the problem of the re-purification of the polluted waters remains unsolved. This being the case, it seems rather wonderful that engineers do not think it worth while to try other methods. The views I bring before you to-night I have long held. This paper was proposed to be read before the Prince of Wales's illness, and would have been read last month had there been an open night. I may mention that I brought the same views before the public five years ago at a Glasgow Sewage Association; three years ago I did the same at the Medico-Chirurgical and Philosophical Societies of Glasgow; and I also read papers on the subject at the Social Science meetings of Newcastle and Leeds; but in no place did I make many converts as to the evils arising from sewer-gas.

The illness of the Prince has recently galvanized many people into the greatest excitement on the subject, but I fear the effervescence may as speedily subside, and nothing be done—that we shall still go on acting contrary to nature's laws, and have the results I have been trying to point out.

In London alone, according to Mr Krepp, thirty millions of money have been spent on water-carriage—we all know with what disappointing results in a sanitary point of view.

These matters, which pollute our rivers, poison our air, and produce disease to so lamentable an extent, are of great value. I believe that £80,000 is a very moderate estimate of the value of the excreta of this city, yet we throw them away, and then ransack the whole earth for bone-dust and guano.

Sanitary science should not rest content till it has made towns as healthy as rural districts—this, at least, should be the result aimed at; and this we shall never be able to do until there is a change in the mode by which excreta are disposed of.

If cholera were epidemic in any place, I have no doubt that every intelligent officer of health would direct that the stools of all patients should be disinfected. Very probably, however, before this was carried out, the mischief would be done by the cholera contagium getting into the sewers or wells.

Why, then, not provide for such an emergency beforehand, by reserving the sewers for the rainfall, and making provision that all excreta shall not be allowed to decompose, but be disinfected,—the progress of what we may term antiseptic chemistry rendering this less and less difficult? I sum up as follows:—

1*st*, That no excreta shall be allowed to pass into our sewers, water-courses, or rivers.

2*d*, That all refuse from manufactories containing organic nitrogen and carbon—*i.e.*, putrescible matter—shall also be kept out of our sewers, water-courses, and rivers.

3*d*, That all excreta shall be submitted to chemical or other action, by which they shall be rendered non-putrescible.

As regards the second point, we would require imperial legislation to prevent organic refuse from being passed into the sewers, etc.; but I think the first and third might be carried out under the powers in the Police and Public Health Acts; and I am quite sure that the gain would, in a short time, exceed the expenditure. I am often told it would be very difficult to carry out these views, but everything really worth having is attended with difficulty, and I cannot but affirm that if a tithe of the time, skill, and ingenuity, and one-thousandth part of the money, had been devoted to investigations in this direction, which have been spent on water-carriage, the problem would have been solved long ago.

I have already said that the numberless patents which have been taken out do not meet the whole case: they either fail in the sanitary—*i.e.*, do not prevent decomposition in the sewers; or in the economic—*i.e.*, do not retain or recover all the fertilizing matters.

I shall therefore enter into no detail as regards them, but bring under your notice some plans which fulfil the requirements I have specified.

1*st*, Mr Moule's earth-closet is known to most of you, and has done well in private houses, asylums, and small villages in this country; and in India has been a very decided success. The great objection to its use in towns is the bulk of the material required. This objection is removed by employing, as Mr Stanford proposes, seaweed charcoal instead of earth. As a very small quantity of charcoal is sufficient, by an improved closet, it is expected that even less than weight for weight of excreta will be found sufficient. I have repeatedly seen Mr Stanford's process in operation, and am convinced it is in every way well worthy of trial; as it satisfies, in all respects, whatever the most ardent sanitarian could desire. The product from the closet is a black mass, somewhat like cinders, free from smell, and without the least appearance of fæcal matter. Mr Stanford considers that eight cwts. per head per annum is sufficient, and that this need only be removed once a year; and the reservoir of char at the top of the house need only be replenished once a year. The closets are arranged to be quite automatic, and require no attendance from within. Mr Stanford values the char after use at 8s. a head per annum, and proposes to burn it in revolving retorts, and to collect in suitable condensers the gas liquor, tar, and gas. The charcoal increases at each reburning, and therefore the plan is self-supporting, unless, indeed, the increased value of the char should render it advisable to sell it.

Mr Stanford's proposal has been so well thought of that a company has been formed to work it, and the large shipbuilders on the Clyde have agreed to adopt it; and I am also told that already arrangements have been entered into to provide closets for works employing 12,000 men.

Captain Liernur proposed some time ago what he terms a pneumatic system of collecting the excreta, and applying it direct to the soil. The great objections to his scheme were that it would require a special plough—that we would require to be always ploughing, or the matter would accumulate, and that if frost came we would be necessitated to cease putting it into the ground.

When a community has been accustomed to water-closets, it is very difficult to get any alteration made, and therefore some schemes have been devised to retain the water-closet, but to prevent the matters from them getting into the sewers.

Mr Strang proposes an upward system of filtration. His apparatus consists of a large box, divided by a perforated bottom, the upper division being filled with cinders, ashes, or charcoal. The lower division receives the contents of the closets; as it fills the water rises through the perforated bottom, passes upwards, and flows off at the top much purified. From time to time the contents of the lower division are removed, and are of considerable value.

Mr Hoey has devised an apparatus which is intended to leave us with all the comfort and convenience of the water-closet, and yet at once to get quit of all the nuisance and dangers of that system.

It is not easy to describe mechanism without drawings, but I shall try and give some explanation of Mr Hoey's plan.

First, The water-closets are left just as they are at present.

Second, The flush-pipe is not attached to the general cistern, but to one holding only one-fifth of a gallon of water, which takes two minutes to fill. When the bar of the water-closet is raised, the supply to this small cistern is cut off, so that it is almost impossible to waste water—it could only be wasted by some one raising the bar every two minutes.

Third, A vessel like a bird-cage fountain is filled with sulphuric acid, and at each time the closet is used a portion of it is discharged with the water by means of a plunger dipping into the acid.

Fourth, The waste-pipe from the closet flows into a reservoir underground, from which the excreta are removed by pneumatic pressure without the slightest offence, and then taken to the country to be evaporated into portable manure.

Instead of the sulphuric acid, I would propose the use of common salt, to which my attention was directed by the researches of Dr Angus Smith. You will find salt very favourably spoken of in his work on Disinfectants, at page 78. At page 128, he tells us that it is seven times cheaper than chloride of lime, and fourteen times cheaper than carbolic acid; and at page 97 we read what was the effect of only two ounces on one cwt. of human excrement. The great advantages of salt are its cheapness, its thorough efficiency, as well as its being itself a valuable fertilizer of soil, and amply repaying the agriculturist for his outlay.

I would recommend the removal of the product of the closets by pneumatic pressure, without in the least disturbing the inmates of the house. It would be conveyed to an establishment where it would be evaporated to dryness, and converted into a portable, and I have no doubt very valuable, manure.

The advantages of Mr Hoey's plan are obvious. Where water-closets are already in use, they leave our household arrangements as they at present are, and save an enormous waste of water.[1]

Then, as the excreta cannot putrefy, it follows that there need be no fear of sewer-gas getting into our houses, or of fæcal matter percolating through the soil into wells, etc. Either of these plans would at once deodorize and render innocuous the stools of patients suffering from infectious diseases; they are not expensive, and could be as easily worked as our present system; while the collected matter, after the evaporation of the water, would make a valuable manure.

All of these schemes show a profit on paper. I think, however, profit should not enter primarily into our calculations. We ought to take a broader view of the question, and ought to feel that this is a gigantic evil, and it must be got rid of. We must not go on living contrary to the laws of nature, lowering our health by breathing impure air, wasting our manure, swelling our death-rates, and robbing posterity.

I do not say which of these schemes is best, or that any of them is perfect; but they are all superior to our present system of water-carriage, and it would well become the authorities of any large community to have them tried, and to prove for themselves which is best.

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[1] To test the powers of this limited supply of water to keep a closet clean, I had one fitted up in my own house, with a cistern only containing $\frac{1}{6}$ of a gallon of water.

It has now been in use for more than two years, and is quite as clean as others in the same house where the supply is unlimited.

If such a closet was generally adopted, there would be a saving of water of several gallons a head.

Mr Hoey tells me that the expense of altering a water-closet to suit his apparatus would be 13s., and that two guineas would be the amount required to put in a tank for six closets, making the expense for each about 7s.

As regards the utilization of the matter from such a closet, I may mention that Mr Chapman has bought the urine from the public urinals of Glasgow from the Police Board for £1000 a year; and he tells me that if the excreta are diluted with not more than four times their bulk of water, he can utilize them. He has already fitted up extensive works for the treatment of the urine.

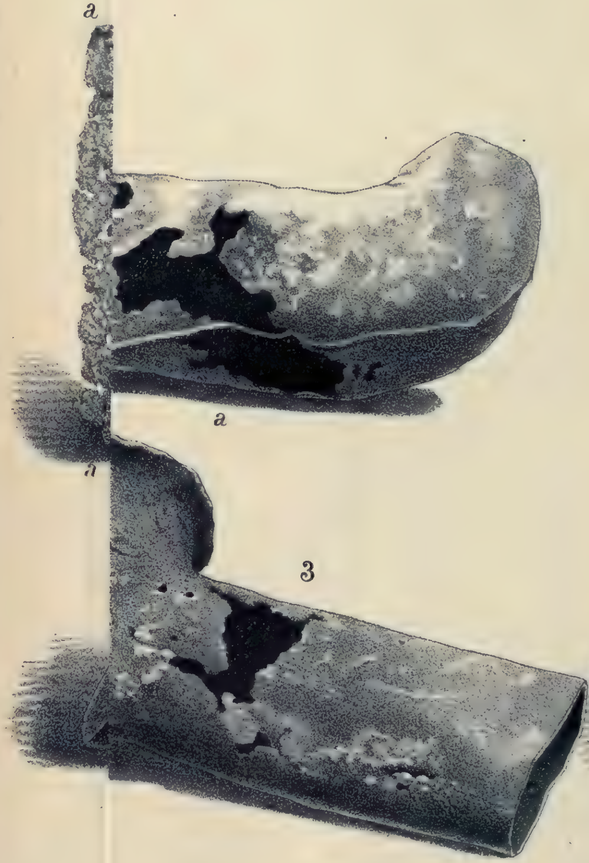
In conclusion, let me emphatically say, that the only true sanitary solution of this question is that all excreta must be kept out of our water-courses and rivers—nay, I go further, and affirm that if it is true, as Dr Benjamin Richardson tells us, that fifteen organic poisons may pass from sewage—if it is true that diarrhœa, cholera, and enteric fever (the first and last killing 35,000 per annum), are traceable to the imbibition or inhaling of the results of decomposing excreta—if it is true that the same causes lower the health and swell the death-rate from other diseases—then I say, that the only satisfactory solution of our difficulty will be found by making provision that all excreta shall, within twenty-four hours of being voided, either be returned to the earth, or shall be subjected to chemical processes before decomposition takes place.

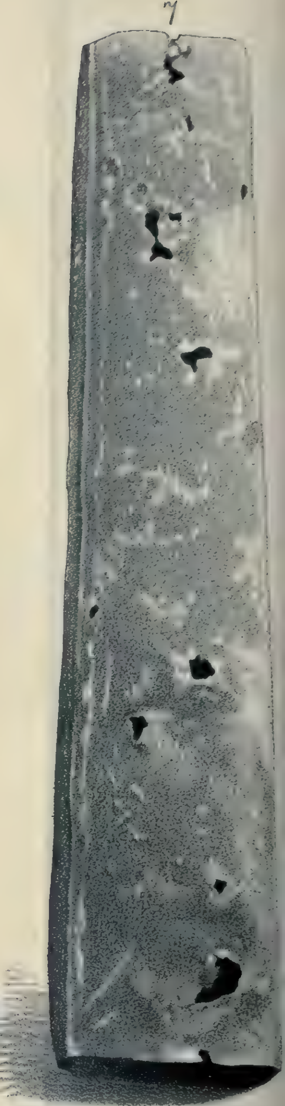
Table *showing the* Number *of* Deaths *in* England *from certain* Zymotic Diseases, *in each Year for which the Record has been made, from* 1838 *to* 1868, *which may be read along with Dr Richardson's List of the Organic Poisons* (*p.* 720).

Years.	Scarlatina.	Diphtheria.	Measles.	Hooping-Cough.	Smallpox.	Fever.	Diarrhœa, Dysentery, & Cholera.	Total.
1838	5,802	...	6,514	9,107	16,268	18,775	3,440	59,906
1839	10,325	...	10,937	8,165	9,131	15,666	3,493	57,717
1840	19,816	...	9,326	6,132	10,434	17,177	4,799	67,684
1841	14,161	...	6,894	8,099	6,368	14,846	4,198	54,566
1842	12,807	...	8,742	8,091	2,715	16,201	7,622	56,178
1847	14,697	...	8,690	9,260	4,227	30,994	15,630	83,498
1848	20,502	...	6,867	6,862	6,903	22,037	15,604	78,775
1849	13,111	...	5,464	9,615	4,645	18,347	74,155	125,337
1850	13,370	...	7,080	7,770	4,666	15,375	14,400	62,661
1851	13,594	40	9,370	7,905	6,997	17,930	18,045	73,881
1852	18,813	74	5,846	8,022	7,320	18,641	21,754	80,470
1853	15,653	46	4,895	11,200	3,151	18,554	20,502	74,001
1854	18,325	203	9,277	9,770	2,808	18,893	42,092	101,368
1855	17,128	186	7,354	10,185	2,525	16,470	15,044	68,892
1856	13,931	229	7,124	9,225	2,277	16,182	15,912	64,880
1857	13,919	310	5,969	10,138	3,936	19,016	24,037	77,325
1858	25,481	4,836	9,271	11,648	6,460	17,883	16,004	91,583
1859	19,907	9,587	9,548	8,976	3,848	15,877	20,597	88,340
1860	9,681	5,212	9,557	8,555	2,749	13,012	11,185	59,951
1861	9,077	4,517	9,055	12,309	1,320	15,440	20,999	72,717
1862	14,834	4,903	9,800	12,272	1,628	18,721	12,667	74,825
1863	30,475	6,507	11,349	11,275	5,964	18,017	16,801	100,388
1864	29,700	5,464	8,323	8,570	7,684	20,106	18,366	98,213
1865	17,700	4,145	8,562	8,647	6,411	23,034	25,894	94,393
1866	11,685	3,000	10,940	15,764	3,029	21,104	32,644	98,166
1867	12,300	2,600	6,588	11,873	2,513	16,862	21,735	74,471
1868	21,912	3,013	11,630	9,223	2,052	19,701	32,427	99,958
Totals	438,706	54,872	224,972	258,656	138,029	404,861	539,046	2,190,144

L PIPES &c

PAPER.





DESCRIPTION OF PLATE.

FIG. 1.—Pipe removed from a house where there was typhoid. Two months before it was taken out, the water-closet had been renewed, but the plumber had failed to detect the state of this pipe.—P. 723.

FIG. 2.—A piece of lead soil-pipe slightly corroded, which entered an iron pipe below a water-closet. The iron pipe much perforated, allowing an escape of sewer-gas, which produced fatal diphtheria.

FIG. 3.—Perforated soil-pipe from house where party died of phthisis.—P. 722.

FIG. 4.—Wire cage, filled with seaweed or other charcoal, to put into the overflow pipe of cistern.—P. 724.

FIG. 5.—Soil-pipe laid open, in which, so numerous were the perforations, that very little of the lead required to be cut. The sides *a a*, *a a*, are irregular owing to these perforations, and they may also be seen over the whitish part. The spaces between *a a* and *á á* are the parts of the soil-pipe covered with the whitish deposit spoken of in the paper. The part within the *b's* is the lower segment of the pipe over which the sewage flowed. It is quite sound—not in the least decayed or worn.—P. 722.

FIG. 6.—Pipe from Edinburgh. It will be noticed that the solder has not decayed, *a*. —P. 723.

FIG. 7.—Main descending soil-pipe, showing the perforations.

Part Second.

REVIEWS.

On the Physiology of Wings. By JAMES BELL PETTIGREW, M.D., F.R.S., etc. Trans. Royal Society, Edinburgh, Vol. XXVII. 1871.

OF those who have striven of late years to place the subject of artificial flight on a philosophical basis, Dr Bell Pettigrew is entitled to take precedence, both in point of time and as regards the quantity and quality of the work done. To this investigator is due the discovery of the celebrated figure-of-8, or wave theory of flight, which has been exciting so much attention on the Continent and in America. Dr Pettigrew has been labouring with indefatigable zeal in this difficult department of science since 1865, and has supplied data which no one but an accomplished anatomist and physiologist could possibly have furnished. There can, we think, be no doubt that he has at length struck the true note, and that the Gordian knot of a most mysterious but delightful subject is in a fair way of being untied, once and for all, for the benefit of posterity. As early as 1867, Dr Pettigrew gave his novel theory to the world in an evening lecture, delivered at the Royal Institution of Great Britain. On that occasion (*vide* Proc. Roy. Instit. of Great Britain, 22d March 1867) he pointed out the interesting fact that the wing was a screw *structurally* and *functionally;* in other words, that the wing when at rest was *twisted upon itself*, and that when it was made to vibrate or reciprocate it *twisted and untwisted figure-of-8 fashion.* The wing was shown to be as effective in water as in air, and the tail of the fish was represented as lashing from side to side, after the manner of an oar in sculling. In June of the same year (1867), he read a memoir on the subject to the Linnæan Society of London (Trans. Linn. Society, vol. xxvi.), in which he described, figured, and compared the movements made by the fins and tail of the fish, and the wing of the bird in flying and diving. These movements, he showed, were *reciprocating movements*, produced by helicoidal surfaces, which were mobile and plastic, and acted at a great variety of angles, so as to obtain a maximum result with a minimum of power, and, what is not less important, with a minimum of slip. The fish was represented as throwing its body into figure-of-8 curves in swimming, and the wing of the bird into similar curves in flying and diving—the figure of 8, when the animals were progressing at a high speed, being opened out or unravelled to form *first a looped, and then a waved track.*[1] The following quotation from his memoir will explain the relation :—"The water and air are acted upon by curve or wave pressure, emanating in the one instance from the body of the fish, and in the other from the wing of the bird—*the reciprocating and opposite curves* into which the trunk and wing are thrown in swimming and flying, constituting, in reality, *a mobile helix or screw*, which, during its action, produces the precise kind and degree of pressure adapted to fluid media, and to which they respond with the greatest readiness." He also contrasted the screw formed by the wing with that at present employed in navigation ; and showed that the latter, which is *rigid*, cannot be compared in point of efficiency with the former, which is *flexible and elastic.* The rigid screw of the ship is made to revolve, the one blade following the other in rapid succession, and all striking at a given angle which never varies. One blade, as a consequence, virtually performs all the work. From the fact that the one blade, which may be taken to represent the whole, moves in only one direction (it revolves round a given axis), it cuts out as it were the portion of water which corresponds with its area of revolution—a circumstance which greatly increases the slip, while it correspondingly diminishes the actual propelling power of the screw. It is otherwise with the screws formed by the tail of the fish and the wings of flying animals. These are *flexible and elastic*, and, when they are made to vibrate, they are also made to reverse the direction of the stroke, and reciprocate in such a manner that the stroke from above downwards, or from right to left, as the case may be, is made to produce a current, which being met by the wing or tail when it makes a counter stroke from below upwards, or from left to right, greatly augments the propelling power. This holds true of every successive stroke made by the wing or tail. This power is further augmented by the elasticity and flexibility which contribute to the continued play of the natural screw, and by the fact that the wing of the bird and the tail of the fish strike at a great variety of angles—this peculiarity enabling them to diminish the slip to a minimum and to increase the propelling power to a maximum. Dr Pettigrew arrived at these results from a careful study of the extremities and travelling surfaces of a large number of animals fitted by nature for moving in water and air, and from numerous experiments with artificial fish-tails, fins, and wings, which he made to vibrate with steam by a direct piston action. Continuing his researches, Dr Pettigrew presented a second memoir on the subject to the Royal Society of Edinburgh, on the 2d of August 1870. This is published in vol. xxvii. of the Transactions of that Society, and in it he gives the details on which the conclusions arrived at in his first memoir were based.[1] It is with the latter we have more particularly to deal at present; but as a knowledge of the first memoir is requisite for comprehending the second, it was necessary to direct the attention of the reader to it before proceeding to a review of the other. The memoir now published in the Transactions of the Royal Society (vol. xxvii.) promises to be the most important of Dr Pettigrew's many important researches. In it he grapples boldly with one of the most abstruse problems at present before the world. He, however, proceeds so cautiously, and is so full of resource, that, as already stated, he bids fair to solve it. His present memoir is divided into two parts—the first treating of natural flight as observed in the insect, bat, and bird; the second, of artificial flight, as advocated by Borelli, Strauss-Durckheim, Chabrier, De la Landelle, Wenham, Stringfellow, Marey, himself, and others. We are at a loss to say which is the more interesting part. Dr Pettigrew takes nothing for granted. He goes to nature and abstracts her secret without the intervention of any third party. In this he forms a striking exception to the great mass of authors who are content simply to *compile*. Neither does he bow to the dust of antiquity nor the glitter of great names. He differs as widely from Borelli, who wrote nearly 200 years ago, as from all those who have written since. He, however, curiously enough, shows that almost all that was known of flight, until quite recently, is traceable to that illustrious physiologist and mathematician. Indeed, he translates Borelli's antiquated Latin into very readable English, and proves that the modern French school is entirely indebted to him for what it knows of natural and artificial flight. The parallel passages, written in 1680 and 1869, although in different languages, are certainly referable to the same head. The authors who have treated of flight since the time of Borelli till the present, are criticised in a fair, candid spirit: what is good is commended; what is doubtful, challenged. Dr Pettigrew shows that the wing acts as a kite both during the down and up strokes, and that it elevates and propels in either case—the rising and falling movements gliding by insensible degrees into each other to form one pulsation; that when the wing rises the body falls, and *vice versa;* that the wing, when the body of the flying animal is advancing in space, describes *a waved track*, the body describing a similar but smaller wave; that the wing is twisted upon itself when at rest and when in motion; that the blur or impression produced on the eye by it when made to vibrate rapidly is concavo-convex and twisted; that the under or concave surface of the wing, in virtue of its being carried obliquely forward against the air by the body, is effective during both the down and up strokes; that the wing rotates in the direction of its length and breadth as it rises and falls; that it reverses its planes more or less completely at every stroke; that it produces during the one stroke the currents by which it is elevated during the succeeding stroke—the wing literally rising on a whirlwind of its own forming; that the wing is movable and flexible as well as elastic, and capable of change of form in all its parts; that it is forced into waves during its action, and impinges upon the air as an ordinary sound does; that it produces a cross pulsation, the pulsatile waves running in the direction of the length of the wing and across it; that during its vibration it moves on the surface of an imaginary sphere; that the natural wing when elevated and depressed must move forwards; that the movements of the wing are comparatively slow at its root, but very rapid at its tip; that balancing is in a great measure effected by purely mechanical arrangements which operate independently of the will of the animal; that weight is necessary to horizontal flight; that the wing acts upon yielding fulcra; that a regulating power is necessary in flight, the wing being at all times thoroughly under control; that the wing in the bird descends as a long lever and ascends as a short one, the tip of the wing describing an ellipse as it does so; that the wing forms a parachute from which the body is suspended both during the down and up strokes; that the wing of the bird opens and closes as it rises and falls, and has a valvular action; that all wings are drawn towards the body and partly elevated by the action of elastic ligaments, etc., etc.

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[1] Nearly two years after Dr Pettigrew wrote, Professor Marey, of Paris, obtained similar results by the aid of the sphygmograph ; and since then M. Senecal, M. de Fastes, M. Ciotti, and others have been labouring in the same field. These investigators have confirmed Dr Pettigrew's original hypothesis, but, so far as we are aware, have added no new facts.

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[1] These memoirs extend to some 220 pages quarto, and are illustrated by nearly 200 original engravings and woodcuts.

Dr Pettigrew's researches are dual in character. He first carefully describes and figures what is found in nature, after which he proceeds to demonstrate that the structures and movements which he has described and figured may be reproduced artificially. He takes, *e.g.*, a fish's fin or tail, and shows that during its action it lashes from side to side figure-of-8 fashion—the margins of the fin or tail throwing themselves into double or figure-of-8 curves as it does so. He then takes the wing of an insect, bat, or bird, and by placing the creature in certain positions the spectator can clearly trace the figure of 8 made by the tip and margins of the pinion. He, however, goes further. He points out how the tail of the fish and the wing of the bird may be imitated both as regards its structure and function. He, in fact, proves experimentally that the fish-tail and the wing have many features in common, and that propellers formed on the fish-tail and wing model are the most effective that can be devised, whether for navigating the water or the air. To operate efficiently on fluid, yielding media, the propeller itself must yield. Dr Pettigrew has made this point very clear; and in this, we think, he has made a valuable discovery, for there can be little doubt that the propeller at present employed in navigation is faulty both in principle and application.

In the second and concluding part of his memoir, Dr Pettigrew explains that the balloon must henceforth be regarded as an effete scientific toy—its existence having, in his opinion, retarded the science of aerostation; that the inclined plane hitherto employed in aeronautics is *rigid*, whereas it ought to be *flexible* and *elastic*; that the old rigid inclined plane is made to attack the air at one angle and at a uniform speed, whereas it ought to strike the air at a great variety of angles and at a variable speed; that the inclined planes at present in vogue either advance in a straight line or revolve in one direction, whereas they ought to reverse and reciprocate; that the aerial inclined planes at present employed draw a current after them which, being never met, is consequently never utilized; that the artificial fish-tail and wing create the currents on which they mainly depend for support and progress by a peculiar reciprocating figure-of-8 action.

Dr Pettigrew further shows how an artificial insect, bat, or bird's wing may be made to vibrate with a wavy, continuous, reciprocating motion, devoid of dead points, the wing literally floating on the air. He points out how a properly-constructed artificial wing will, when elevated and depressed, inevitably dart forwards in a series of opposite curves, and that by altering the angle of inclination of the wing with the horizon, it may be made to fly upwards and forwards, horizontally, or downwards and forwards—flight, as he explains, being essentially not a vertical but a progressive and almost horizontal movement. He likewise gives directions as to the nature of the forces to be employed in driving artificial wings and propellers. The artificial wings and propellers, he states, are made to resemble the wing of the insect, bat, and bird, or the caudal fin of the fish. They are composed of flexible and elastic material, which varies in thickness, the thicker portions, which are consequently the more rigid parts, corresponding to the root and anterior margin of the wing and the root and lateral margins of the tail of the fish. When made to vibrate or reciprocate, the margins of the propeller formed on the wing and fish-tail model are thrown into double or figure-of-8 curves, from the fact that the propeller twists and untwists during its action. This twisting movement enables the propeller to evade and seize the water and air alternately with wonderful rapidity and power—the efficiency of the propeller increasing in a direct ratio to the velocity with which it is made to vibrate. By adding springs which antagonize each other, the propeller is lashed about with greater facility and with a more continuous play—a similar result being obtained by working the steam expansively.

Time will not admit of our pursuing this fascinating subject farther. Enough, however, has been said to show that Dr Pettigrew has struck out an entirely new path; that his memoir "On the Physiology of Wings" is a model research, unique of its kind, and most honourable to its ingenious and industrious author. It is by far the most complete monograph on the subject in any language. The labour involved in its production is incredibly great; but unless we are much mistaken, the reward will equal the toil, for it appears to us to contain germs which are destined to develop sooner or later into Herculean proportions. This much is certain—no one can pretend to understand either swimming or flying who is not intimately acquainted with Dr Pettigrew's very remarkable observations and experiments. His writings under these heads will, we venture to predict, be standard works of reference for the next half-century.

Clinical Lectures on Diseases peculiar to Women. By LOMBE ATTHILL, M.D., etc. Dublin: Fannin and Co.: 1871.

IT is well known with how thin a disguise of contempt the better part of the medical profession regards those who traffic in ulcers of the womb, displacements or curvatures of the womb, strictures, and many more of the same sort—such as cures of sterility. Dr Atthill has had to go over all these important subjects in his lectures, and we are gratified to notice that he everywhere endeavours to keep to a scientific or quasi-scientific treatment of them; and, in these days, this is no mean praise. Our author evidently feels for something better than a quasi-scientific position; but, alas! it is not to be found as yet in this or any other department of therapeutics. Yet we can at least avoid that horrid form of intestine quackery, so rife among fashionable physicians, which traffics in frightening or amusing ladies—especially those who have fat purses—by prolonged cures of the "womb out of place," of two "ulcers," or of a "severe stricture." The evil done in this way is incalculable, and it is aggravated by the circumstance that the "cures" are attempted often by dangerous modes of treatment. Indeed—apart entirely from quackery or semi-quackery in any of its forms—it is to be observed that the profession seems to have need of some new variation of the apophthegm—That a doubtful remedy is better than none. It is extensively forgotten that a remedy should not be more dangerous than its corresponding disease, and that the circumstance of a dangerous remedy having in addition the character of an *anceps remedium*, does not justify its being regarded as *melius quam nullum*. Dangerous remedies have been long popular in gynækology, while they have greatly gone out of fashion in other departments of medicine. Dr Atthill is generally careful in his practical recommendations, but not always sufficiently so. His treatment of one kind of menorrhagia is scarcely to be classed among doubtful remedies. Patients thoroughly treated as he suggests, will certainly have no more menorrhagia; they may be glad if they have even a uterine cavity left. This kind of treatment reminds us of the "cough no more" lozenges, regarding which it was, we believe, truly said that the patient would never again cough if he only took enough of them. The treatment is one which may have been tried, but which we are pretty sure has never been carried out. Speaking of a granular state of the mucous membrane of the entire cavity of the uterus, our author says:—"Destroy the so-called granulations, 'and endeavour to excite healthy action in the diseased part.' With this view I invariably make use of the strong nitric acid, applying it with extreme freedom to the interior of the uterus."

Second Annual Report of the State Board of Health of Massachusetts. Boston: Wright and Potter: 1871. Pp. 433.

So many reports are published nowadays, that the valuable and interesting matter occasionally entombed within boards of various hues is too apt to escape notice, unless attention be incidentally and extraneously attracted to it. The present blue-book is an apt instance of this—it has lain too long unnoticed, and yet it contains a mass of matter of the very greatest interest in a sanitary point of view.

It will be remembered that, when the water of St Mary's Loch was proposed to be introduced into Edinburgh, one important question which arose was, Whether such a water would not be dangerous, from its action on the lead pipes employed to distribute it? and that several distinguished chemists answered this question negatively on the strength of various laboratory experiments. In 1848 it was proposed to supply the city of Boston with water from Lake Cochituate, which is similar in quality to that of St Mary's Loch; its possible action on lead was then made a subject of inquiry and answered in the negative. We have now before us the results of twenty years' practical experience, and a comparison of that with the results of laboratory experiment is eminently instructive.

"When the introduction of Cochituate water into Boston was under discussion, Professor Horsford of Cambridge made a series of experiments with regard to the action of the Cochituate, as well as of other waters, upon lead (see Boston City Documents, 1848, Nos. 18 and 32; also Proc. Amer. Acad., ii., p. 64). He concluded that lead pipes could be used with safety for its transmission, and that the coating formed would be to such an extent insoluble and impenetrable, that after a certain time the action of the water would be practically nothing. These experiments in the laboratory have a certain value, yet too much importance must not be given to them, performed, as they are, with small quantities of water and with a limited amount of metallic surface, and with the relative amounts of the two so different from those that are brought together in actual practice. Indeed, experience has shown that some waters, which in the laboratory seemed to corrode lead but slightly, really act very violently on the pipes through which they are conveyed.

"With regard to the action of the Cochituate water on lead, we should infer from the small quantity of chlorides and nitrates, and from the proportionally large quantity of carbonates, that this action would not be very considerable, and we are now in a position to determine from the actual experience of so many years how much it really amounts to. I have tested many samples taken from the pipes under various conditions, and have never failed to find indications of the presence of lead." . . . . .

"In view of the quantitative determinations made, and of a number of qualitative tests, from conversation with men of experience engaged in the plumbing business, and from personal examination of various samples of lead pipes which have been in actual service, I feel justified in asserting:—

"(1.) That Cochituate water which has passed through lead pipes is never absolutely free from lead.

"(2.) That when the water is first introduced into the pipes, there is more action on the pipes, as far as contamination of the water is concerned, than subsequently, but that after a few days' service the quantity of lead in the water is practically very small.

"(3.) That there is always more lead in the water after it has stood for some hours in the pipes than when it is allowed to flow freely.

"(4.) That when the water passes through a lead-lined tank it will be likely to contain in solution or suspension a more considerable quantity of lead salts, from the fact that the lead is corroded more rapidly on the sides of the tank at the surface of the water. Moreover, in such tanks there is generally a considerable extent of surface of contact between solder and the lead.

"(5.) That in the introduction of water into the pipes, the first effect is the tarnishing of the brightness of the lead due to the formation of oxide or suboxide; that there begins to form, almost immediately, a coating consisting on the *outside* of a brown and, at first, rather loose deposit (the colour of which is not due to iron-rust as is ordinarily supposed, but to organic matter), and *underneath* of a white deposit composed mainly of carbonate of lead; that this coating increases with time in firmness and also in thickness, but that the rate of increase is so slow that practically the pipes used for conveying *cold* water do not wear out and become unserviceable except from some accidental circumstance, as the freezing of the water, or, as is often the case where the pipes are laid under ground, from corrosion from the outside, or from a cause immediately to be mentioned. That, however, the pipes even under ordinary conditions would eventually wear out, I have no doubt, as there seems to be no limit to the action. I have indeed a specimen of a pipe which, being in contact with cold water only for a period of fifteen years, was so corroded in the vicinity of a solder-joint as to be eaten through, and along the pipe there is a thick coating consisting almost entirely of carbonate of lead (with organic matter, a little carbonate and sulphate of lime, and a trace of oxide of iron) which has penetrated the pipe in some places to the depth of 1-15th of an inch and more. There is one other circumstance contributing to the wear of cold-water pipes which is not to be overlooked. The water is delivered in many cases under such a pressure that the pipes tend continually to expand. The effect of this is often to strain the pipes so as to form longitudinal seams or grooves of greater or less length, and the corrosion, taking place under such favouring circumstances more rapidly, sometimes extends through the pipe, which is thus rendered unserviceable by a combination of chemical and mechanical action.

"(6.) That pipes used to convey *hot* water are corroded more or less rapidly, a deposit similar to that in the cold-water pipes being formed, and the corrosion manifesting itself most decidedly in the vicinity of the solder-joints, and where the pipe is sharply bent. Whether the iron-rust, coming from the *water-backs* in which the water is heated, contributes to produce this effect, I am not prepared to say. The disarrangement of the particles of the lead and the change in its mechanical structure, brought about by the alternate and unequal contractions and expansions to which it is subjected, must present more favourable opportunity for the corrosive action due simply to the passage of the water through the pipes." . . . .

"From the evidence given, it seems reasonable to believe that the use of lead pipe for the conveyance of drinking-water is always attended with a certain degree of danger, because such water always contains lead; and that this danger varies in degree with the character of the water conveyed, and the susceptibility to lead poison of those who drink it.

"The chemist can say that water containing air (or natural water) always acts upon lead; but he cannot say that a certain kind of water will, under all circumstances, take up and convey in solution only a certain proportion of lead. The physician finds it equally impossible to say that a certain proportion of lead in water will hurt no one.

"From these two shifting elements of difficulty come all the doubt and obscurity which have made the influence of lead-pipe water a disputed question.

"How much lead can we habitually take without injury? No one would voluntarily add it in ever so small amount to the water of the spring, well, or lake which supplies his drink, yet thousands and even hundreds of thousands of people in Massachusetts do constantly receive it in very minute amounts without manifest injury.

"No well-authenticated instance of lead-poisoning from the Boston water has come to our knowledge, although lead pipe is almost universally used for its distribution. The same statement may be made as regards Charlestown and Worcester, and is doubtless true of other large cities and towns supplied by waterworks from lakes of great purity. We may conclude from experience and observation that the character of the water in these cities is such as to dissolve lead in so small amounts as to be generally harmless,—and we use the word 'generally' advisedly, because, although paralysis and wrist-drop, and the most distinctive signs of saturation with lead have not been observed, it does not therefore follow that minor obscure ailments, particularly of the nervous system, have not been aggravated or even caused by this subtle poison. There are a great many cases of neuralgia, of (so-called) rheumatism, and of dyspepsia, whose causes are unknown.

"When we see that Professor Nichols finds one-ninth of a grain of lead to the United States gallon (equal to one-eighth of a grain to the English gallon) in the hot-water pipes of a private house in Boston, and remember the possibility of such water being habitually used for cooking purposes, it is well to be cautious in giving it a good character under all circumstances.[1]

"But if the lake water of the cities mentioned is generally incapable of dissolving a dangerous proportion of lead, it is equally certain that the water of springs and of wells is very often ready to dissolve an amount which will produce dangerous disease.

"The chemical evidence already presented shows that it is so difficult as to be practically impossible to say, even when we know the constituents of the water, whether it will dissolve dangerous amounts of lead until it has been actually tried by domestic use and for considerable periods of time.

"It is well that we should have some idea of what have been found to be dangerous amounts of lead for habitual use.

"Dr Angus Smith says that one-fortieth of a grain per gallon will affect some persons, while one-tenth of a grain may be required for others. Dr Parkes, a high English authority, thinks that any quantity exceeding one-twentieth of a grain per gallon must be regarded as unsafe. These opinions are also held by Professor Graham, Dr Taylor, and other equally known chemists and physicians. Dr Adams, of Waltham, reports a case of poisoning in which only one-hundredth of a grain per gallon was found in the water. In the celebrated case of the poisoning of the family of Louis Philippe by drinking water which had been stored in a lead tank, the amount of lead was seven-tenths of a grain per gallon. This quantity affected 34 per cent. of those who drank it.

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[1] A case of lead-poisoning recently occurred in the city of New York, which was traced to the use of Croton water (whose character has been thought safe), drawn from the hot-water pipes after standing in them all night. In this water "cracked wheat" was soaked every morning, preparatory to boiling.

"The susceptibility of individuals to the action of poisons, whether metallic or non-metallic, is known to differ exceedingly. Many persons pass half their lives in ignorance of their own peculiarity in this respect, and then have revealed to them by some lucky accident that what to their neighbours has been harmless, has been for a long term of years the source of great discomfort or illness."

The conclusion arrived at from a consideration of the important facts just noted being the very proper one, that "The only safe practice with water which has not been tested with lead pipe by long experience is, to use some other material than lead for its conveyance," and, we may add, storage and distribution.

Again, the profession are well aware how much importance has been attached, especially by English writers, to the production and propagation of typhoid fever and other zymotics by drinking water contaminated by decomposing organic matter, especially when of excrementitious origin, and that the cure proposed for this is the providing from a pure source of a supply of water, sufficient not only to supply the wants of the inhabitants, but also to efficiently flush the sewers. The experience of Boston in this respect has been somewhat remarkable. Previous to 1848 it "was riddled with wells and privies, side by side, all over its limited and very crowded territory. Sewage contamination of drinking-water was inevitable. The water must have been continually charged with the products of decomposition, and even direct mixture of decomposing animal matter of the most repulsive kind must have been frequent.

"Since 1848, the Boston water from Lake Cochituate has been almost as free and abundant as air, and (except, perhaps, from the influence of lead pipe) is of the purest possible quality. Very few wells are now in use, or have been for many years. We do not know of the use of a single one. Here are conditions to test the influence of drinking-water as a means of propagating typhoid, on a grand scale, and, for aught we see, complete. The result seems to be a diminution of typhoid, but in no very striking degree; only such a diminution as might be looked for if the purification of air rather than of water were in question. The sewers are now at all times discharging very large amounts of water, and carrying away from among us impurities which otherwise would linger in the drains. The sewers are more thoroughly washed,—and the people too."

Nevertheless, it is not denied that the typhoid poison occasionally enters the system through the stomach; indeed, satisfactory proof has been obtained from other parts of the state of Massachusetts, of so definite a character as to leave no doubt that the fever poison was received through drinking-water. The "typhoid poison seems capable at times of resisting the power of rejection or of change which the stomach so often exhibits when noxious things have succeeded in passing the sentinels of sight and taste. Cases are reported in which it is impossible to doubt that the disease was received by absorption through the alimentary canal, but in the great majority of cases occurring in Massachusetts in which causes can be traced, *air* (and not water) must be regarded as the vehicle.

"The evidence is here still more direct. Among the most striking experiences are those given in the letters from Swampscott, Hadley, Watertown, Lexington, and Marshfield. The Kearsage Avenue cases in Boston seem very conclusive on this point. Running through the whole correspondence is a recognition, more or less complete, of the agency of putrid air in causing typhoid fever. This faith is not universal, yet it seems quite general in the medical profession. There are those who see it plainly and express it clearly, as in the words of our venerable correspondent at Oxford:—'So firm is my belief of this (referring to exhalations from foul drains, cellars, privies, and pigsties), that when I meet with a case of typhoid fever not readily traceable to some of these causes, I infer that *the truth has not been told me, or that my perceptive faculties have been at fault*.'

"And this leads us to refer to the difficulty which is often encountered in tracing to its hiding-place the real or probable cause of the mischief. A man almost instinctively resents the supposition that his premises may be foul. It is a kind of personal affront which a physician may well doubt the propriety of giving on mere suspicion, and without proof. A sensible man should, of course, receive such suggestions in the spirit in which they are offered, but, unhappily, all people are not sensible. But suppose suspicion to be excited concerning the state of a cesspool or a drain, or any other concealed structure, or even one only half concealed, like a privy vault. It is by no means an easy thing to learn their exact condition. The bad smell which they may emit is no certain indication (or, perhaps we should say, no certain measure) of their danger to health. There is reason to suspect that the fever-producing poison is odourless, and that, under certain circumstances, it may be set free from decomposing substances before the foul-smelling compounds of hydrogen come to give us warning.

"The danger may be greatest when decomposition is (so to speak) going on under difficulties—when it is impeded, suppressed, or imperfect.

"A physician may suspect a connexion between a sink-spout or a drain and the family well, but unless the water is offensive to the taste he finds it very hard to prove it without breaking up the ground with much cost and labour. He may suspect similar connexions of conduits for air or water, or both combined, which would poison a family, but the work of tracing them is expensive and troublesome, and requires time and special skill which may not be at his command. It needs perseverance, and a kind of training to be got only by experience to unearth these half-hidden nuisances. Look at the history of the typhoid poisoning of a family in Watertown in 1868 in the preceding correspondence. The first examination of the drain proved nothing; the second was only partially successful; the third made evident the cause of the disease. If the proprietor of this house or his physician had been content with the first search the record of these cases would have come down to us, like that of so many others, as from 'causes unknown and perfectly mysterious.'"

The Report then refers to the accumulation of decaying vegetable matter in cellars as a source of typhoid fever, and enters into an elaborate and important investigation into the influence of putrefactive emanations from the soil in the production of this disease. Innumerable difficulties beset these inquiries, owing, in a great measure, to the fact that this poison, though possibly always present, is not always equally active; this being in all probability due to its being generally destroyed or neutralized by Nature's great disinfectant, ozone, only becoming effective when that is deficient from unknown atmospheric causes, when it is from equally unknown terrestrial causes in excess of its neutralizer, or when from bodily constitution those exposed to its action are temporarily more sensitive. In this way destitution plays no unimportant part in the spread even of fevers which in no way arise out of it, and temporary febrile conditions of purely climatic origin pave the way for the reception of specific fever poisons, even in those who have seemed to be thoroughly acclimatized, so to speak, to their action. We must also remember, in regard to typhoid or enteric fever, that not only are we capable of becoming acclimatized to its poison, but that it is a very common disease of childhood, little fatal in such circumstances, and not unfrequently unrecognised, while one attack, as a rule, confers immunity for the rest of life. All these various causes are capable of fully accounting for the many exceptional cases of escape from such diseases in circumstances where escape seemed hardly possible, such as those related by Parent-Duchatelet and others, and we fully endorse the sentiments with which this Report concludes, which are thus expressed :—

"We cannot more fitly conclude these remarks on the probable causes of the typhoid fever of Massachusetts than by again quoting one of the most original and far-seeing men of the last century, Dr Benjamin Rush, who says :—'To every evil the Author of Nature has kindly prepared an antidote. Pestilential fevers furnish no exception to this remark. The means of preventing them are as much under the power of human reason and industry as the means of preventing the evils of lightning or common fire. I am so satisfied of the truth of this opinion, that I look for the time when our courts of law shall punish cities and villages for permitting any of the sources of bilious and malignant fevers to exist within their jurisdiction.' "

Dr Bowditch, the chairman of the State Board of Health, contributes a long report on houses for the people, on convalescent houses, and on the sewage question, based on investigations made in England, all of it worthy of careful reading. The following remarks on the sewage question are at once interesting and amusing:—

"There is no single subject that is attracting more attention in England, and which excites (strange as the remark may seem to some people in Massachusetts) more heated partisanship than the vast questions looming up under the various names of 'earth-closet,' 'water-closet,' 'sewage,' 'its danger to health,' 'its widespread and fatal waste,' 'its utilization as a manure,' etc. In other words, the great sanitary question of to-day throughout Great Britain is the economic removal from houses of what is deleterious to man, and the proper use, as a source of income, of what has been heretofore wholly wasted. Thousands of pounds sterling are annually sent from England to Egypt to gather up the old mummied remains of past centuries of men, or merchant vessels sail round the world in order to gather the fæces of birds, that perhaps for equally long cycles of time have brooded over some one or more of the beautiful islands of the Pacific Ocean. And all this expense is incurred, while actually throwing away immense quantities of a material having the highest fertilizing qualities.

"These vexed questions cropped out and were bandied about from section to section of the meeting of the British Association for the Advancement of Science, recently held at Liverpool, and presided over by the celebrated Huxley. . . . .

"The subject was every day brought up in some way or another in the Health section, and I soon found that partisan violence was not confined to republics alone, nor to political parties, nor could theology ever produce more bitter denunciations than were poured out by one party upon the other upon this subject. If I had not been amused I should have been indignant at hearing men whose works I have read for a quarter of a century, and thought were men of consummate wisdom, sagacity, and coolness, use language worthy of Billingsgate toward an unlucky and persistent supporter of the 'earth-closet' idea. This poor abused article, which many have found so serviceable to their houses and private rooms, would have been utterly annihilated if the venerable statistician and writer on health could by any word of his have gained that end. One opponent of this unhappy article declared, for his part, that he was unwilling to 'take counsel' from so foolish a creature as the cat, who, from the time of Noah, has quietly been teaching what Rev.

Mr Moule proclaimed, *ex cathedra*, only a few years ago. Dr Farr at length came to the mediation of both parties by suggesting that, after all, both had the same object at heart, viz., the disinfection and removal of unwholesome articles from our homesteads, and the only diversity of opinion was on a minor point, viz., the method to be pursued for that disinfection and removal."

The effects of the use of alcoholic drinks on the public health are also ably considered; and the Report is concluded by an inquiry into the influence on health of the use of milk from cows affected with aphtha epizootica, in which large use has been made of a paper which appeared in our number for February 1863, p. 704, but which the author has surely not fully read, as he advises boiling the milk as a means of destroying the contagion, while there it is shown that a temperature much lower than that of boiling renders the milk unsightly, to say the least of it, by coagulating the albumen with which it is contaminated.

Neuralgia and the Diseases that resemble it. By FRANCIS E. ANSTIE, M.D. Lond., etc. London and New York: Macmillan and Co.: 1871. Pp. 296.

THE views developed in this work were briefly sketched by the author in his article on Neuralgia, in Reynolds's "System of Medicine," some three years ago. They are now given to the world in a more complete form. He endeavours to vindicate for neuralgia a distinct and independent position, and to show that it is not merely an offshoot from gout or rheumatism, and still less a mere symptom of a score of different and incongruous diseases. In order to do this fully it has been necessary to give a separate account of all such spurious neuralgias as are of sufficient importance to demand it, especially of such as are most likely to lead medical men astray in their diagnosis.

The idea of neuralgia developed in this work is, that it is essentially an atrophy of the posterior root of the spinal nerve in which the pain is felt, and that this atrophy is produced in some cases by a centripetal neuritis migrans causing a limited myelitis, which issues in atrophy, the subjective expression of which is neuralgic pain, while in others he believes that the peripheral irritation stops short of the production of an actual myelitis, though the result is similar, viz., the production of a non-inflammatory atrophy in cells of posterior nerve-roots which are congenitally of weak organization. We have read Dr Anstie's work with the greatest pleasure, and we hope with profit, and we can conscientiously recommend it to our readers as a fair attempt at the enunciation of a reasonable pathology of a disease which is sufficiently common, and more than sufficiently important, from the suffering it occasions, and its frequent rebelliousness to treatment, to constitute it one of the gravest sources of anxiety to the practitioner. Dr Anstie's views require to be maturely considered before we can accept them in their entirety; meanwhile, they provide us with a clue which may ultimately guide us to a more successful treatment of this obstinate disorder. Some of his statements we are able to confirm, especially as to the remarkable connexion he has pointed out between the migraine of adolescence and the ophthalmic neuralgias of later years, as to the advantages of cod-liver oil in the very young and in the aged, the utility of quinine in non-malarial ophthalmic neuralgias, and its non-utility in other neuralgias of non-malarial origin, and particularly as to the remarkable effect of arsenic even in a form of neuralgia so alarming and usually so obstinate as angina pectoris. The whole chapter on the treatment of neuralgia is, however, of extreme interest, and exhibits in every page that innate capacity for duly appreciating the therapeutic influences of drugs, without which no one can be a great practitioner, just as the previous part of his work reveals that power of analyzing symptoms and referring them to their proper source which constitutes a good pathologist, both faculties being necessary to any one who aspires to the character of a sound physician.

Notes on the Treatment of Skin Diseases. By ROBERT LIVEING, A.M., M.D. Cantab. Second Edition, with Additions. London: Longmans, Green, and Co.: 1871. Pp. 104.

WE have already spoken favourably of the first edition of this little work, and we congratulate the author on its so speedily attaining a second edition. It is a useful and handy note-book of cutaneous medicine, suitable for the pocket, and containing a concise glossary of the terms employed, and a useful formulary.

Part Third.

MEETINGS OF SOCIETIES.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXI.—MEETING III.

Wednesday, 13*th December* 1871.—Dr THOMSON, *President*, in the Chair.

WALTER FORBES, M.D., 4 West Newington Terrace, was admitted as an ordinary Fellow of the Society.

I. *Dr D. Gordon* read a paper on a new kind of MIDWIFERY

FORCEPS. The separation of the blades from the handles of the obstetric forceps greatly facilitated their use; but the principal difficulty, that of locking them, remained, and is now, for the first time, entirely removed by the improvement which I have now to mention. It is simply this :—The handles, hitherto separate, are *united* by a common circular or scissor joint. This is a feature in the instrument which, with the separate blades, is entirely new, and renders its use more easy and accurate. Their proximate ends are so made as to slip easily into sockets suited to them in the stems of the blades, to which they become securely fixed by catch-springs. When the blades are introduced and properly adjusted on the head, the handles, *united*, are readily applied to them, and immediately, the operator finds he has the head already firmly fixed in the grasp of the instrument, and that all the difficulty of locking has been avoided. Another important improvement is that the blades are so much more curved, and fit the head so closely, that no space is left between them and the presenting part of the head. By this, the difficulty of extraction, especially when the outlet is narrow, and the danger of injury to the soft parts, are much lessened. The handles are of steel, small and short, but well curved, so as to give a secure hold.

Dr Thomson thought that the blades were not long enough; they would be very apt to slip; and, moreover, the lever power was not sufficiently great for long-forceps cases.

Dr Craig said the handle was faulty, as there was no catch for the hand, which would be liable to slip when the instrument got covered with the discharges.

Dr Ritchie thought that the catch-spring was too weak, and the scissor-joint gave very little compressing power.

Dr Keiller did not think that the blades were large enough to encircle the head and afford space for its proper moulding. In long-forceps cases, all knew the difficulty of getting the blades quite opposite each other, and the necessity, therefore, of having as loose a joint as possible. With Dr Gordon's joint it would be almost impossible to get the blades fixed on the handle in such cases; the greasy state of the blades, too, would add to the difficulty in managing them. In simple cases, where the head was down on the perineum, he granted that the instrument might be useful. However, he promised to give the forceps a fair trial.

Dr Sidey said the handle was the chief point, as you might get blades of any size or shape to fit it.

Dr Young mentioned a case recently under his care—a lady æt. 44, first pregnancy. She had been in labour a day and a half; the soft parts were very rigid, and the head large. He applied Simpson's forceps, and although he exerted all his strength, it was thirty-five minutes before he succeeded in delivering her. He did not think that he could have managed it with the instrument before him.

Dr Bell was so satisfied with the instruments at present in use, that he saw no reason for having new ones. He never had any difficulty in applying Simpson's forceps, nor had he ever seen any serious consequences follow their use. With regard to Dr Gordon's remark, that his new instrument might be employed without either the patient or her attendants being aware of it, he was of opinion that no operation should ever be performed without the full consent of the patient or some near relation.

Dr Gordon said the joint might be made looser. The blades, he maintained, were sufficiently long. If longer, they would prove injurious to the soft parts of the mother, by projecting beyond the head. He had no doubt but that in a short time his new instrument would be the forceps in general use.

Part Fourth.

PERISCOPE.

On the Therapeutical Value of the Hypodermic Injection of Ergotine in Hæmoptysis.—Dr Currie Ritchie of Manchester has recently employed this treatment in nine cases of hæmoptysis. Case 1.—A. B., aged 22, spat florid blood in June last, after a long walk, in considerable quantity. From that time till September had more or less cough, with occasional streaks of blood in sputa, menstruation regular, was then seized, after dancing, with severe hæmoptysis, lasting from 2 A.M. till 11 A.M., when Dr Ritchie found her anæmic, with a troublesome cough, and expectorating mouthfuls of blood. Five grains of ergotine dissolved in water were injected into the left arm, and perfect rest in bed enjoined. No expectoration of blood took place after the injection, and two months afterwards she was apparently in perfect health. Case 2.—W. S., aged 30, had mitral regurgitation, with consolidation of apex of left lung. Dr Ritchie found him, at 2 A.M. of 20th September, labouring under profuse pulmonary hæmorrhage, which had already lasted one hour. In Dr Ritchie's presence he expectorated two ounces of florid blood. Five grains of ergotine dissolved in water were injected subcutaneously, the hæmorrhage was at once arrested, and did not return. Case 3.—A man, aged 26, had purulent expectoration for more than two years, with occasional streaks of blood. On 26th September came to Dr R. labouring under severe hæmoptysis, which had lasted for two days continuously, in spite of medical treatment; according to his own account, he had spat up several pints of blood. His face was blanched, and the mucous lining of his lips and cheeks very pale. Five grains of ergotine dissolved in water were injected subcutaneously; not a single bloody sputum followed the injection till the 28th, when a repetition of the injection was followed by a similar abrupt cessation of the hæmoptysis, which, however, recurred on the night of the 29th, probably owing to domestic inquietude from his wife insisting on carrying him off to Ireland. Case 4.—F. B., aged 62, had suffered from slight hæmoptysis for several days. Five grains of ergotine in watery solution were injected. At the end of two days the hæmorrhage continued as before; a repetition of the injection was followed by complete cessation of the hæmoptysis, only one or two small dark-brown coagula following the second injection. Case 5.—A. N., aged 17, had a cavity the size of an orange in the apex of her left lung when first seen, and shortly afterwards was attacked by severe hæmoptysis. Five grains of ergotine in watery solution were injected, and only one single bloody sputum followed the injection. No return of the hæmorrhage had taken place a month after when last seen. Case 6.—J. C., aged 22, spat blood in May last for two or three days, and again a fortnight later. She remained in fair health till 11th October, when hæmoptysis again recurred to the extent of "nearly a quart of bright red blood" before Dr R. saw her. Five grains of ergotine in watery solution were injected, and no more blood was expectorated till the 15th, when, after a severe fit of coughing, a streak of blood was detected on three several occasions in the sputum. In this case the injection produced a good deal of pain and induration round the seat of puncture, lasting till the 19th of October. Case 7.—K. M., aged 19, had slight hæmoptysis for several days; a few hours before being seen had spat up several mouthfuls of pure blood. Five grains of ergotine in watery solution were injected subcutaneously, only one bloody sputum followed, and a fortnight later there had been no return of the bleeding. Case 8.—J. W., aged 28, caught cold in March last, and continued to expectorate phlegm for two or three months; he then caught a fresh cold, and ever since his sputa have been streaked with blood. The sputa are tenacious, not frothy; expectorates most blood when at work, but feels easier there. Five grains of ergotine in watery solution injected on 1st November. Expectoration of blood took place once on 1st November, and once on the morning of the 2d; but, in the afternoon of the 2d, it became considerably increased, and continued till the 6th. So much irritation had been produced by the injection, that Dr R. did not repeat it till the morning of the 7th, when three grains of ergotine were injected, dissolved in equal parts of glycerine and spirits of wine. There had been no return of the hæmoptysis on the 14th when last seen, and no trace of irritation from the second injection. Case 9.—Mrs D., aged 60, under Dr Bowman's care. On the 19th October had been spitting blood continuously for two days, except for about six hours, when there was almost complete cessation. At 3 p.m. on the 19th hæmoptysis recommenced, and she was ordered ten-minim doses of the liquor ergotæ every two hours, without effect. At 9 P.M. she was expectorating blood profusely, an incessant hacking cough compelling her to do so every few seconds. At Dr R.'s suggestion, Dr Bowman injected five grains of ergotine dissolved in water, after which there was absolutely no hæmoptysis, and when last seen, on 26th October, she was apparently quite well.—*Practitioner*, Dec. 1871.

[These cases are very instructive, and worthy of consideration. We have not found the solution in glycerine and spirit less irritating than that in pure water, usually the reverse. Injection over the sternum, where there is little cellular tissue, is always, however, productive of more irritation than in the arm, where the cellular tissue is more lax; irritation in the latter position we have been more inclined to attribute to a dirty needle (introduction of germs?) than to the nature of the fluid introduced. Dr R. very correctly remarks, that ergot introduced by the stomach is not nearly so efficacious as when injected subcutaneously in all those cases where the immediate development of its physiological action is required; and we may make the same remark in regard to other drugs, for a similar requirement necessitates a similar employment of many other remedies besides ergotine and narcotics.—ED. *E. M. J.*]

ON EARACHE.—In the October number of *The Practitioner*, Dr Anstie related his personal experience of an attack of auricular herpes zoster in a most instructive and interesting manner, and he then pointed out that many of the cases of earache in children were due to a similar cause. He stated that earache is very common in children, that in a large proportion of them there is no gradual increase of pain and swelling of the meatus auditorius till relieved by discharge of pus, but that the pain, in a large proportion of cases, sets in with great severity at once, is unattended by any but the most moderate tumefaction within the meatus, rarely followed by any discharge of pus, but mostly by the shedding of small scales, like the dead epidermis of faded vesicles, accompanied by a very little bloody serum—precisely what occurred in his own case. He then pointed out that, though children are as liable as adults to herpes zoster, it is in them rarely accompanied by neuralgic pain; and he inquired why auricular shingles alone should in them be accompanied by a true neuralgia. And though he could give no proper answer to this query, he pointed out a valuable suggestion that may hereafter lead to a solution of this question, viz., that from the exhausting influence of the growth of the teeth upon the superior and inferior maxillary nerves, they are, in children of a nervous temperament, extremely liable to severe paroxysms of true neuralgic pain darting into the ear, throat, and cervical nerves, arising from a very slight amount of dental caries; that they were the first of all the sensory nerves to exhibit any tendency to neuralgic pain; and that the peculiar physiological life of individual portions of the nervous system was doubtless connected with peculiar pathological tendencies to pain, convulsions, etc., a subject which has as yet been too little attended to. He also pointed out the practical conclusion to be drawn from this view of infantile earaché, viz., that to leech is injurious, and that the best treatment for it would be to inject morphia subcutaneously, sedulously to exclude the air from the whole nerve territory affected, and to apply mustard or cantharides over the "occipital triangle" of anatomists, taking care that the irritation should not be too severe, for fear of setting up erysipelatous inflammation over the neck, face, and scalp.

In the December number of the same journal, Dr Dalby points out as the means of making a differential diagnosis of the various causes of earache, that, when it depends on inflammation of the meatus, tenderness of that part is revealed by the introduction of the ear speculum even before there is any tumefaction or redness of the part—the marked difference of the sensations elicited in examining the affected and the unaffected ears revealing the true nature of the case. In the earache of auricular shingles there is entire absence of this tenderness. But he adds, that earache depending on catarrh of the middle ear is more likely to be confounded with the pain arising from auricular herpes, because in it we have no tenderness of the meatus, and because the pain in it is not continuous, as in inflammation of the meatus, but remittent; and he points out that, in the early stages, this affection is to be recognised by impaired hearing, and by the presence of increased secretion within the middle ear lobe, recognised by auscultation—a piece of light india-rubber tubing being made to connect the ears of patient and surgeon, while the former inflates the tympanic cavity with his mouth and nose closed. In children, the tympana must be artificially inflated by blowing into the nose while they swallow; in very young children swallowing is unnecessary, because in them the faucial orifice of the Eustachian tube is extremely patent.

On the Use of Bromide of Pottassium in Epilepsy. By M. Jules Falret.—He gives the results of his treatment at Bicêtre during the years 1867–70, where he treated, almost invariably, confirmed cases where the disease was of long standing. He begins by giving 15 grains a day, very gradually increased until the dose of one drachm is reached. This usually diminishes the number of attacks, and is then persisted with; if not, the quantity is again increased, every week or fortnight, until eight scruples, or two drachms, are taken daily. If considerable improvement results, and if no bad consequences are observed, this dose is continued for one or two years, and then gradually brought down to the original dose of 15 grains. He attaches great importance to the slowness with which the dose is increased and diminished; and ascribes most failures to suddenly leaving off the medicine. By this treatmeant he states that he has cured one-seventh of his cases, greatly improved three-sevenths, and failed with the remainder. Attacks of maniacal violence proved most amenable to treatment; next in order came nocturnal fits, then diurnal; vertigo and the "petit mal" being most difficult of cure, these last sometimes taking the place of ordinary fits under treatment. An acneiform eruption on the face, shoulders, and back is generally observed as soon as the daily dose of one drachm is reached; when it is not produced, M. Falret usually finds that the bromide does no good—it sometimes becomes so annoying as to prevent treatment being continued. Considerable loss of mental power and other cerebral symptoms, of course, indicate an immediate suspension of the remedy; they seem to M. Falret more frequent in private practice than at Bicêtre. One patient died very suddenly, while taking only moderate doses of the bromide; the author analyzed the viscera, and found considerable accumulation of the salt in the brain and liver.

This paper was read before the Société Médico-Psychologique, and gave rise to two very interesting discussions, of which only the most salient points can be given here.

M. Morel looked upon the doses given as "fearful;" he has himself rarely given more than two scruples or one drachm daily.

M. Legrand du Saulle, on the contrary, stated that he saw no danger in such large doses, provided they were only arrived at very slowly: his full dose is two drachms and a half daily, which he only attains after several months' treatment. With this precaution, he has never seen any evil results, not even emaciation. He believes, however, that such large doses are only needed for men, and that women are sufficiently acted upon by half a drachm to one drachm daily. He has treated 138 cases in all, cured 10 of these, greatly improved 19, improved 45, and failed in 64. He prefers the bromide of sodium for chorea, hysteria, hemicrania, and the early stages of melancholia; and the bromide of ammonium in all forms of cerebral congestion; he has seen it relieve symptoms of this kind in general paralysis with great rapidity.

M. Voison, who was the originator of this graduated method of administering the bromide, read a long critique upon M. J. Falret's paper. Besides acne simplex and indurata, he has observed another eruption of specific character in persons taking the salt. This consists of patches of confluent acne pustules, generally on the calves of the legs, which end by producing adherent scabs, and sometimes ulcers difficult to heal. He shows, by figures, that the occurrence of skin eruptions is no evidence of a favourable action of the remedy, which he looks for in some sign that it is acting on the medulla oblongata. This he finds by titillating the pharynx, nares, and epiglottis, and observing whether the reflex acts of nausea, sneezing, and coughing are produced. As soon as they cease, he considers the medicine to be producing its physiological action, and, therefore, to be acting beneficially upon the disease. He dwelt at some length on the various phenomena of bromism (among which he has once seen acute mania), and urged that no patient should be allowed to take more than one drachm of the bromide daily, without being frequently examined by his physician. Of 41 cases (generally of confirmed epilepsy) treated by M. Voison, 17 have had no attack for five years, 20 are improved, and 4 remain in the same state. No one seems to have questioned the efficacy of the bromide during these two meetings, but, since then, M. Delasiauve and a few men of less note have expressed doubts as to its curative action in confirmed epilepsy, and have seen increased violence of attacks follow its suspension. What would they have said, had they known that Binz and other Germans totally deny that the bromides have any different action from the chlorides of the same bases?—*Journal of Mental Science*, January.

ARTIFICIAL PRODUCTION OF EPILEPSY IN GUINEAPIGS. — M. Brown-Séquard has published some interesting experiments on the artificial production of epilepsy in guineapigs. These are in continuation of the experiments which he performed by mutilating the spinal cord; and he now finds that division of the sciatic nerve or of its principal branch, the internal popliteal, produces the same results. In a few days after the operation it is found that irritation of a certain portion of the skin brings on various clonic and tonic spasms, and finally an attack of true epilepsy. The skin thus affected is an oval space on the same side of the body as the mutilation, and is bounded by a line connecting the following points: the anterior palpebral angle, the projection of the upper jaw-bone, the centre of the inferior maxilla, the scapulo-humeral articulation, the middle of the anterior edge of the scapula, the lobe of the ear, and so back to the starting-point. At the same time this "zone épileptogène" loses its power of sensation, lice accumulate in it, etc.—*Journal of Mental Scicnce*, January.

REPORT ON TOXICOLOGY, FORENSIC MEDICINE, AND HYGIENE. By BENJAMIN W. RICHARDSON, M.D., F.R.S.—*Toxical Studies on Chloral Hydrate.*—The most important subject, in a toxicological point of view, that has been under discussion since our last report, has relation to chloral hydrate. The increasing employment of this narcotic by the members of the general public, without the advice of the professors of medical science, has been attended by several fatal occurrences; while in instances where fatal results have not taken place, peculiar symptoms have followed the frequent self-administration of the narcotic—symptoms of serious import, and demanding ready recognition. We have, consequently, devoted some labour to the investigation of certain facts bearing on the toxicological history of chloral hydrate, to which, and the results of our inquiries, we would now direct attention.

1. We have endeavoured to ascertain what is a dangerous and what a fatal dose of chloral hydrate. The conclusion at which we have been able first to arrive on this point is, that the maximum

quantity of the hydrate that can be borne, at one dose, bears some proportion to the weight of the animal subjected to its influence. The rule, however, does not extend equally to animals of any and every class. The proportion is practically the same in the same classes, but there is no actual universality of rule. A mouse weighing from three-quarters of an ounce to an ounce will be put to sleep by one quarter of a grain of the hydrate, and will be killed by a grain. A pigeon weighing twelve ounces will be put to sleep by two grains of the hydrate, and will be killed by five grains. A guineapig weighing sixteen ounces will be put by two grains into deep sleep, and by five grains into fatal sleep. A rabbit weighing eighty-eight ounces will be thrown by thirty grains into deep sleep, and by sixty grains into fatal sleep.

The human subject, weighing from one hundred and twenty to one hundred and forty pounds, will be made by ninety grains to pass into deep sleep, and by one hundred and forty grains into a sleep that will be dangerous.

From the effects produced on a man who had of his own accord taken a hundred and twenty grains of the hydrate, and who seemed at one period to be passing into death, we were led to infer that in the human subject one hundred and forty grains should be accepted as dangerous, and one hundred and eighty as a fatal dose. Evidence has, however, recently been brought before us which leads us to think that, although one hundred and eighty grains would in most instances prove fatal, it could, under very favourable circumstances, be recovered from.

Dr Hills, of the Thorpe Asylum, Norwich, has, for example, favoured us with the facts of an instance in which a suicidal woman took no less than *four hundred and seventy-two grains* of the hydrate dissolved in sixteen ounces of water, and actually did not die for thirty-three hours. Such a fact, ably observed as it was, is startling; but it does not, we think, militate against the rule that one hundred and forty grains is the maximum quantity that should, under any circumstances, be administered to the human subject.

2. A second point to which our attention has been directed is, what quantity of hydrate of chloral can be taken with safety at given intervals for a given period of time, say of twenty-four hours. To arrive at some fair conclusion on this subject, we calculated from a series of experiments the time required for the development of symptoms from different doses of the hydrate, the full period of the symptoms, and the time when they had entirely passed away. Great difficulties attend this line of investigation; but we may state, as a near approximation to the truth, that an adult person who has taken chloral hydrate in sufficient quantity to be influenced by it, disposes of it at the rate of about seven grains per hour. In repeated doses, the hydrate of chloral might therefore be given at the rate of twelve grains every two hours for twenty-four

hours, with less danger than would occur from giving twelve times twelve (144) grains at once; but we do not think that amount ought, except in the extremest emergencies, to be exceeded, in divided quantities.

3. A third point to which we have paid attention is, the means to be adopted in any case when, from accident or other cause, a large and fatal dose of chloral hydrate has been administered. We can speak here with precision. It should be remembered that this hydrate, from its great solubility, is rapidly diffused through all the organism. It is in vain, consequently, to attempt its removal by any extreme measures after it has fairly taken effect. In other words, the animal or person under chloral, like an animal or person in a fever, must go through a distinct series of stages on the way to recovery or death; and these stages will be long or short, slightly dangerous or intensely dangerous, all but fatal or actually fatal, according to the conditions by which the animal is surrounded. One of the first and marked effects of the chloral is reduction of the animal temperature; and when an animal is deeply under the influence of the agent, in the fourth degree of narcotism of Dr Snow, the temperature of its body, unless the external warmth be carefully sustained, will quickly descend seven and even eight degrees below the natural standard. Such reduction of temperature is itself a source of danger; it allows condensation of fluid on the bronchial pulmonary surface, and so induces apnœa, and it indicates a period when the convulsion of cold (a convulsion which sharply precedes death) is at hand.

We offer these explanations in order to indicate the first favourable condition for the recovery of an animal or man from the effects of an extreme dose of chloral hydrate. It is essential that the body of the animal be kept warm, and not merely so, but that the air inspired by the animal be of high temperature. The first effort to recovery, in short, should consist in placing the animal in a warm air. This fact is perfectly illustrated by experiment on the inferior animals. In the pigeon an air of 95° Fahr. is most favourable, in the rabbit an air at 105° to 110°, in the dog the same. In man the air to be breathed should be raised to and sustained at 90° Fahr. at least.[1]

The next thing to be remembered in the recovery of persons under the fatal influence of chloral hydrate is to sustain the body by food. I find that even under deep sleep from the narcotic, although the process of waste is less than is common under natural conditions of rest, there is still a very considerable waste in progress, which, if not made up, is against recovery. I find also that the digestive and assimilating powers, though impaired during sleep from chloral, are not arrested, but may be called into fair action with so much advantage, that if two animals be cast into deep sleep by an excessive quantity of the narcotic, and one be left without food and the other be artificially fed on warm food, one-fourth of the chance of recovery is given to the animal that is supplied with food. In the human subject warm milk, to which a little lime-water has been added, is the best food. Milk is very easily administered mechanically, and it should be administered in the proportion of half a pint every two hours.

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[1] We have no doubt it will be found, as the chronicle of death from chloral hydrate increases, that the mortality from the agent will be the greatest when the thermometrical readings are the lowest, and *vice versâ*.

4. The fourth point to remember is to sustain the breathing; in the inferior animals the question of life or death can be made to turn on this pivot. But the artificial respiration must be carried out with great gentleness; it must not be done by vehement movements of the body or compressions of the chest, but by the simple process of inflating the lungs by means of small bellows, through the nostrils. We have devised in the course of our researches various instruments for artificial respiration—viz., a small double-acting bellows, a small syringe, and a double-acting india-rubber pocket-bellows; and we have lately made an instrument which acts by a simpler method still, *i.e.*, we merely attach to a single hand-bellows a nostril-tube, and gently inflate the lungs, letting the elasticity of the chest-wall do the work of expiration. A little valve near to the nostril-tube effectually stops all back currents from the lungs into the bellows. For the human subject, five charges of air from the bellows should be given at intervals of five seconds apart.

The symptoms of acute poisoning by chloral hyrate are, briefly, profound coma, great muscular relaxation, apoplectic breathing, and flushing of the face and neck, with intermissions of pallor. The eyes are usually rolled upwards as under chloroform, and at times, as impressions of motion are made on the surface of the body, there is muscular tremor, which may pass into convulsion. In time the extremities become cold, and the bronchial surfaces become charged with frothy mucus, which greatly impedes the breathing and hastens the final result.

The chronic symptoms of chloral-poisoning are—sleeplessness, unless the narcotic be taken in very large doses; great mental irritability and muscular prostration; uncertainty of movement, with tendency to fall forward; caprice of appetite and frequent nausea. In some cases there is injection of the conjunctivæ, and in other cases yellowness. The urine, in extreme cases, contains albumen, and the bowels are commonly constipated, the evacuations being white and hard. Chloral hydrate does not produce the ecstatic dream or delirium caused by opium or haschish; on the contrary, it causes, through all the stages of its action, a sense rather of depression than of elevation of mental faculty.—*British and Foreign Medico-Chirurgical Review.*

Notes on Chloral.—Mr Fairthorne says, in the last number of the *American Journal of Pharmacy*:—Pure hydrate of chloral, according to Dr Rieckher, does not take fire when heated in a spoon over a spirit lamp, but evaporates without residue [the alcoholate when similarly treated inflames]. Nitric acid, sp. gr. 1·20, either cold or hot, should not produce any reaction with it. I find that its aqueous solution produces a dense precipitate when mixed with solution of subacetate of lead. The hydrate is readily dissolved by alcohol, ether, oil of turpentine, benzole, bisulphide of carbon, and the fixed oils. The solution in the last-named article might prove of value to the physician as a topical application, perhaps available in neuralgic or gouty affections. When equal parts of camphor (in small pieces) and hydrate of chloral in crystals are shaken together in a vial and allowed to stand, they become fluid, forming a clear solution. This might also be of use as an external remedy. When hydrate of chloral and sulphuric acid are mixed, a great reduction of temperature takes place. Both pure chloral and its aqueous solution dissolve morphia freely. Quinia is soluble, to a considerable extent, in a strong solution of hydrate—six grains readily dissolving in one and a half fluid drachms. Cinchonia, strychnia, veratria, aconitia, atropia, are also soluble in the same menstruum. From this it appears to be a general solvent for the alkaloids, and perhaps their solutions might be used with advantage for making ointments, or for mixing with oils for liniments, etc. The solution of quinine just mentioned is somewhat fluorescent, but not quite as much so as that of the sulphate. When chloral and glycerine are mixed, a crystalline substance is formed in a few hours. Chloral is a good solvent for camphor or for crystallized carbolic acid, which it deprives of odour to a great extent and renders quite soluble in water. When the latter solution is added to sulphuric acid a pink-coloured solid is produced, which is probably a compound of sulpho-carbolic acid and chloral. When benzoic acid is added to chloral and slightly heated it dissolves, and when cold the mixture solidifies into beautiful radiating crystals.—*Philadelphia Medical and Surgical Reporter.*

Part Fifth.

MEDICAL NEWS.

CORRESPONDENCE.

(To the Editor of the Edinburgh Medical Journal.)

SIR,—In a former communication under the above heading, I directed the attention of my fellow-practitioners to the hygienic and hydrotherapeutic treatment adopted at Ben Rhydding, and the advantages to be derived from a sojourn in that institution. I now wish to show that this peculiar form of treatment is of great antiquity, and entitled to the confidence of the profession.—I am, Sir, yours etc., MEDICUS.

BEN RHYDDING AS A HYGIENIC AND HYDROTHERAPEUTIC ESTABLISHMENT.

There are few things absolutely new, and hydropathy, which has been regarded by many as a modern invention, is in reality only a revival of a very old form of treatment. It is an error to suppose that Priessnitz was the founder of the so-called water cure, and that Gräfenberg was the source from which the cool stream originally flowed. According to Plato, the manner of purifying by water is as ancient as the Flood; for this author, in his third book, "De Legibus," affirms that the gods purified the earth by the Flood, for which end they brought it on the earth; and from this opinion sprang the custom of purifying, by immersion, mankind as well as the earth; which opinion is also favoured by Grotius when he discourses of strangers initiated into Judaism by baptism.

In the Vatican at Rome, a colossal statue, eight feet in height, is dedicated to Æsculapius, this being presumably a portrait statue of Antonius Musa, who cured the Emperor Augustus of his defluxions by the aid of bathing. The term employed by the ancient Greeks to signify the cold bath was *psychrolousia* (ψυχρολουσία), and that used by the Romans *piscina.* In Greece and Rome hydropathy was raised to the dignity of a science. By the application of water in various forms, these nations believed that health could not only be preserved, but also most diseases cured. The Greek and Roman baths were sumptuously fitted up, and consisted of two parts, the hot air or hot water bath, and the cold bath. It was customary for the ancients first to bake or parboil themselves, and then suddenly to plunge into cold water. This custom has been revived in the modern Turkish bath.

It is very difficult, often impossible, to pursue the trail of knowledge. Customs which at first sight appear peculiar to one period and to one country, are found, on more extensive inquiry, to have prevailed at various periods and in countries widely removed from each other. So much is this the case with regard to habits and modes of life, that we are almost forced to conclude that civilisation is not due to a uniform spreading from one centre, but to an amalgamation and spreading from several centres. This is especially true of bathing. The celebrated William Penn, the founder of Pennsylvania, found a system of hot and cold bathing in full force among the Indians of that state in 1700; and baths closely resembling the Indian ones have been discovered in our own islands during the present century. The Roman occupation sufficiently accounts for a knowledge of hot and cold baths in Britain, but it is difficult to understand how the aborigines of the American continent came by their information. The most remarkable circumstance, perhaps, consists in the identity of the primitive Indian and British baths. They were very rude, but nevertheless very effective. In both cases they were composed of oven-like chambers as air-tight as possible, into which red-hot stones were thrust; the stones in some cases being covered with green leaves. When the patient was in a state of profuse perspiration, he emerged and soused himself in a neighbouring pool or river, the colder the better. The cold baths of the poorer Romans, according to Horace and Seneca, consisted of simple springs which were not even covered over; and this habit of immersion in open springs, rivers, or lakes, for the cure of divers diseases, obtains in Britain even at the present day. In fact, it is not six months since we read in the public prints of a bevy of lame and halt individuals who assembled on the banks of a Scottish lake to be immersed at the witching hour of twelve. This is but an imitation and repetition of the rites performed at the famous pool of Bethesda. Diodorus Siculus informs us that the first Egyptian king bathed and adorned himself in his royal robes before he went to sacrifice; and Porphry affirms that the ancient Egyptian priests, in performing extraordinary sacrifices, bathed three times a day. Diogenes Laertius, in the Life of Plato, mentions a cure effected by Egyptian priests by bathing in salt water, it being a general belief at that time that salt water purified both body and soul, *ϑάλασσα ϰλύζει πάντα τῶν ἀνθϱώπαν ϰαϰὰ.*

The Israelites during their captivity in Egypt are represented as frequently bathing. They were also (Ezekiel xvi. 4) in the habit of washing their new-born children in salt and water—a custom which likewise prevailed throughout Asia. Hippocrates, in his treatise on Ancient Physic, states, "If any person in health cools himself very much in the winter time, either by bathing in cold water or otherwise, the more he is cooled (if his body be not perfectly congealed), the more vehemently he will become hot when he puts on his clothes again and comes into a house."

Agathinus describes the good effects arising from the application of cold water very succinctly. He says, "They who desire to pass the short time of life in good health ought often to use cold bathing, for I can scarce express in words how much benefit may be had by cold baths; for they who use them, although almost spent with old age, have a strong and compact flesh, and a florid colour in their face, and they are very active and strong, and their appetites and digestion are vigorous, and their senses are perfect and exact; and in one word, they have all their natural actions well performed."

Dion Cassius informs us that Musa prescribed the *hydroposia* (the internal administration of water and medicine) as well as the *psychrolousia* (cold bath) when he cured Augustus.

Various other passages in favour of bathing might be adduced from the writings of Homer, Suetonius, Seneca, Pliny, Cælius Aurelianus, Galen, Æginceta, and Ætius; but a sufficient number have been cited to prove that from the earliest times, all nations have had more or less faith in the efficacy of the bath, alike in health and disease. What every one believes is usually, although not necessarily, true. Tested by time and experience, bathing has certainly braved the ordeal, and is entitled to a high place in the healing art. Bathing and drinking of water formed part of a very old system of treatment—the other parts of the system consisting of *exercise and moderate living*.

Hippocrates recommended hot and cold bathing as part of his gymnastic art, the cold water to be employed after the exercise of the *palæstra*; the hot, after other exercises ("Third Book of Diet"). The spring used after hot bathing and moderate exercise at Rome, was an exceedingly cold one, called *Virgo*. In it the *athletæ* were wont to lave their manly limbs.

Paulus Ægineta commends cold baths, and advises the bather to use an exact diet and convenient exercise.

The emperor Alexander Severus adopted this plan, for Lampridius states that this potentate drank cold water in the morning *fasting*—that he ate sparingly in the forenoon, and that he engaged in running, ball-play, or wrestling, prior to taking his *piscina* (cold bath). He then ate much bread and milk, eggs and mulsum. This discipline was calculated to make all who had recourse to it strong and vigorous. The process of hardening was well known to the ancient Britons. Cæsar, in his Commentaries, tells us that our semi-savage forefathers daubed their exteriors with paint, and freely exposed themselves to the rigors of the climate, being almost naked. He adds that the Suevi and old Germans (whence the Saxon race) adopted similar practices, being only partly covered with skins. To come nearer home, our own famous countryman, George Buchanan, informs us in his Scotch History, that the Picts went naked and painted their bodies; that the Scotch Highlanders slept upon the snow, or made themselves beds of heath with the flowery ends upwards, which, *mollitie cum pluma certant, salubritate vero superant* (in softness vie with the feather, and in healthfulness greatly exceed it). He further tells us that the inhabitants of the Orcades preserved the vigour, beauty, and largeness of their body, as well as health in their mind, by their observing their old parsimony; and that their ignorance of the nice and luxurious ways of living conduced more for preserving their health than any medicinal art. The passage, "*And that their ignorance of the nice and luxurious ways of living conduced more for preserving their health than any medicinal art*," is significant. It teaches the present generation a grave lesson. Extravagant, artificial living introduces unheard-of evils into a community. It may be likened to a hollow ball placed upon an inclined plane, which, when once set in motion, runs faster and faster until, coming suddenly in contact with some more solid and sterner stuff, it smashes itself to pieces. It was so with Babylon of old, with Greece, with Rome, and, as recent events have shown, with modern France. Luxurious living had destroyed the thews and sinews of war in those nations—had enervated their men and debauched their women. It occurs to us that Britain is rapidly getting into a somewhat similar condition, and it may become a question (the discussion of which will admit of no delay) whether or not we are in a state to meet our less luxurious and hardier neighbours in the field. This problem is already before the country, and the late military manœuvres in England were expressly undertaken to try the strength of the backbone of the sea-girt isle. There is no folly to compare with that of rivalry in living. Progressive splendid living may not inaptly be compared to the tuning of a harp or other stringed instrument. By pinching and screwing you obtain a higher note—a more brilliant result—but snap go the strings, one after the other, and all is anarchy, confusion, and bankruptcy. How many heart-strings are snapped in this process of tuning or living up, the unfortunate dupes of a suicidal system alone can tell.

It will be evident from the foregoing that the ancients were fully alive to the numerous benefits to be derived from systematic bathing, regular exercise, and a moderate or even spare diet. Their example in these matters is worthy of all imitation.

Preliminary Education in the Medical Profession.—Language is the vehicle, and, to some extent, the producing power, of thought. It may be too much to claim that a good thinker of necessity presupposes an adept in language; but we may safely assume, *other things being equal*, that the accuracy and force of our thought will be in proportion to our knowledge and skill in language. Single words have such diversity of meaning, and phrases such variety of import, depending on their relations to other words and phrases, and often varied by the subject on which they are employed, that two minds of equal capacity, and giving equal heed, may draw different conclusions from the same lecture or the same chapter, and yet both be wrong. A very little knowledge of Latin, my own experience has proved, greatly facilitates our apprehension of the force and import of English words. If so much is not attained already, it should be attempted. A little success will amply repay all the sacrifice it may require. A large number of professional terms in medicine are derived from the Greek; and these often compounded from several roots, of diverse import. Being wholly ignorant of Greek myself, as a consequence I have probably expended more time, during my life, in turning the leaves of all sorts of lexicons, to attain the required elucidation, than goes to the legal term of medical pupilage; and what was very disheartening, sometimes my search was unsuccessful. Though I am far from regarding ignorance of Greek and Latin as an insurmountable bar to fair attainments in our profession, I have little doubt that six months devoted to the study of these languages, under a competent teacher, during pupilage, or even in the early years of practice, would be amply repaid, by increased facilities in learning aright the principles of medicine. The benefit is not all comprised in the disclosure of the literal import of terms compounded from Greek and Latin roots; but in the subjugation of the mind to the power and significance of cultivated language, pervading and irradiating the whole range of study. Indeed, if there be one indispensable prerequisite for the successful study of medicine, it is knowledge and skill in the language in which it is presented to the mind of the student; the master key to all the learning which the same language furnishes for its elucidation.—Dr J. L. CHANDLER, in *Philadelphia Medical and Surgical Reporter*.

ON THE USE OF BINIODIDE OF MERCURY OINTMENT IN SPLENIC ENLARGEMENT.—In regard to this, a correspondent writes as follows:—"I see it is objected that, in the treatment of splenic enlargement by the biniodide of mercury ointment, friction has as much, if not more, to do with the cure than the drug. This view is not borne out by the history of the application, which is curious. About 1855 or 1856, Major Cunningham, at Belliah, a cavalry station near the Terrai, where spleen abounds, was using some ointment of the iodide of mercury to reduce a splint on one of his horse's legs. One of his servants asked for some of the ointment to apply to a friend's spleen. Major C. laughed, and said it would be of no use. "Oh," said the man, "if it will take away bone (alluding to the splint), surely it will take away spleen." The ointment was given. Some time after he again begged a supply of ointment for two friends; and, on being questioned, stated that the former patient had been *cured!* These also were cured; and soon Major Cunningham found every morning after breakfast a number of candidates for the application sitting in front of his house. As the simplest way of doing this, the ointment was kept in a pot, and with a large brush a dab was put over the enlarged organ. Natives not being much pushed for time, and fond of gossip, they used to sit for an hour or more in the sun comparing notes, with their stomachs exposed to the sun in order not to soil their clothing. It was soon found that this generally produced vesication, and that such cases did best. Major Cunningham let his plan be known; it was adopted in all spleen localities, and with very wonderful success. Ptyalism *very rarely* occurred; and, when it did, was not found to be injurious."

SMALLPOX still prevails amongst us. During December it constituted 17·3 per cent. of the entire mortality in Edinburgh, 31 per cent. in Leith, and 38·8 per cent. in Dundee—the other principal towns suffering to a much smaller extent, Paisley and Greenock having no fatal cases at all. Upwards of 200 smallpox patients are now in hospital, and its treatment is costing the city £1000 per month. Is prevention a myth? or is it simply not believed in?

The introduction of smallpox from Leith, Dalkeith, etc., into the

Infirmary and King's Stables Hospitals cost certainly no little money; and we are now paying handsomely for the treatment of an epidemic, the advent of which has assuredly been hastened, if not caused, by want of faith in prevention.

We have much pleasure in presenting to our readers the following report of the Alloa Cottage Hospital for the past year. This hospital has been in existence for three years, and the number of the cases treated during last year is just double that of the first, showing the acceptance in which it is held by the population among whom it is placed. The economy of these small hospitals may be learned from the fact that the expense per case has been always little above £3; this year it is only £3, 10s.

Tabulated List of Cases treated in the Alloa Cottage Hospital from October 1870 to October 1871.—Peter Brotherston, F.R.C.S. Ed., Surgeon.

No	Name.	Age.	Sex.	Residence.	Disease.	Date of Admission.	Result.
1	W. D.	24	Male	Clackmannan	Disease of knee joint—joint excised	July 28, 1869	Died Nov. 14, 1870.
2	R. T.	44	„	Blairingone	Compound comminuted fracture of left humerus, and simple fracture of radius and ulna, and extensive wound of right ham	„ 2, 1870	Cured Nov. 14, „
3	J. A.	44	„	Alloa	Ulcer of leg	Aug. 9, „	„ Nov. 1, „
4	A. M.	—	„	Alva	Compound comminuted fracture of left thigh and right arm—both amputated	„ 15, „	„ Oct. 20, „
5	M. S.	22	Female	Sauchie	Acute ulcer of right leg	Sept. 7, „	„ Nov. 15, „
6	J. D.	13	Male	Alloa	Fracture of both bones of left leg	„ 7, „	„ Jan. 5, 1871.
7	H. C.	32	„	„	Fracture of forefinger, and injury to hand—finger amputated	Oct. 15, „	„ Dec. 2, 1870.
8	J. S.	24	Female	„	Varicose ulcer of right leg	„ 24, „	„ Dec. 3, „
9	G. H.	14	Male	Sauchie	Left leg destroyed and right knee lacerated—leg amputated	„ 28, „	In Hospital.
10	T. S.	63	„	Alloa	Destruction of three fingers of right hand, and laceration of forefinger—fingers amputated		Cured Dec. 20, 1871.
11	G. A.	11	„	Collyland	White swelling—amputation of right leg	Nov. 8, „	In Hospital.
12	J. S.	46	„	Alva	Whitlow—amputation of right middle finger	„ 15, „	Cured Jan. 20, 1871.
13	H. L.	61	Female	No fixed resid.	Inflamed bunion	„ 15, „	„ Nov. 29, 1870.
14	W. L.	58	Male	Sauchie	Amputation of thumb	Dec. 3, „	„ Jan. 2, 1871.
15	P. M.	11	„	Alva	Concussion of brain	„ 8, „	„ Dec. 19, 1870.
16	W. R.	15	„	Alloa	Destruction of middle and ring fingers of left hand—fingers amputated	„ 17, „	„ Feb. 9, 1871.
17	A. D.	16	„	Whins	Destruction of right arm—amputated	„ 20, „	„ Mar. 18, „
18	J. R.	29	„	Clackmannan	Morbus coxarius	Jan. 4, 1871	Reliev'd Jan. 21, '71.
19	A. C.	23	„	Whins	Exostosis of distal phalynx of left great toe—exostosis excised	„ 9, „	Cured Jan. 21, 1871.
20	M. S.	22	Female	Sauchie	Phlegmenous erysipelas of right hand and arm	„ 30, „	„ June 20, „
21	R. R.	48	„	Devonside	Ovarian dropsy	Feb. 7, „	Incurable.
22	W. M.	14	Male	Dollar	Amputation of finger	„ 14, „	Cured Mar. 11, „
23	J. F.	11	„	Alloa	Stone in the bladder—lithotomy	Jan. 26, „	„ May 5, „
24	E. S.	14	Female	Clackmannan	Two fingers destroyed, and amputated	Mar. 4, „	„ Mar. 29, „
25	R. F.	17	Male	Clackmannan	Open joint of middle finger of left hand—amputation of finger	„ 4, „	„ Mar. 25, „
26	J. D.	9	„	Sauchie	Gelatinous degeneration of left knee joint	„ 7, „	In Hospital.

No.	Name.	Age.	Sex.	Residence.	Disease.	Date of Admission.	Result.
27	J. F.	11	Female	Collyland	Morbus coxarius	Mar. 14, 1871	Cured July 31, 1871
28	W. P.	50	Male	Alloa	Carbuncle of right hip, ending in fistula—operation for fistula	Jan. 23, "	" Mar. 21, "
29	T. K.	30	"	"	Rupture of lateral ligaments of right ankle joint	Mar. 28, "	" May 13, "
30	J. H	22	"	Fishcross	Encysted tumour of left thumb—excised	" 29, "	" April 7, "
31	H. M.	27	"	South Alloa	Extensive contusion of right elbow, with fracture of condyles of humerus	" 29, "	" May 17, "
32	J. D.	66	Male	Blairlogie	Irritable sloughing ulcer of right ankle joint, extending up the leg—leg amputated above knee	April 1, "	Died June 18, "
33	J. A.	25	"	Alva	Fissure of anus, with contraction of sphincter muscle—division of sphincter muscle	" 8, "	Cured April 21, "
34	M. M.	34	"	Seaman	Fracture of sternal end of right clavicle	" 21, "	" April 28, "
35	A. G.	13	"	Alloa	Severe laceration of left thumb—amputation	" 21, "	" " "
36	J. M'B.	16	Female	"	Destruction of right little finger and distal phalynx of right ring finger—amputation	" 22, "	" May 12, "
37	L. A. J.	38	Male	Seaman	Injury to right ear and temple	" 27, "	" May 1, "
38	S. H.	22	"	"	Pneumonia	May 2, "	" May 6, "
39	J. F.	40	"	Alva	Blind from amaurosis—bursal swelling of right knee, and disease of right elbow joint	" 13, "	Died June 14, "
40	W. D	16	"	Alloa	Hydrocele—tapped	" 15, "	Cured May 24, "
41	A. F.	57	Female	(U.S. America) Tillicoultry	Disease of lumbar vertebræ—the actual cautery applied	June 2, "	Relieved July 6 "
42	J. S.	53	Male	Tillicoultry	Extravasation of urine—deep incision into the perineum	" 7, "	Cured July 12, "
43	A. F.	22	"	Alloa	Simple fracture of right tibia and fibula through upper third	" 17, "	" July 29, "
44	H. P.	35	"	"	Fracture of fore arm and destruction of left thumb—amputation of thumb	" 22, "	" July 18, "
45	J. P.	18	"	"	Rupture of left saphena vein, and extensive extravasation of blood	July 6, "	" Aug. 9, "
46	M. M.	—	Female	Tillicoultry	Strangulated hernia of omentum and bowel	" 7, "	" July 18, "
47	W. M.	20	Male	Devonside	Compound fracture of right ring finger—amputated		" May 18, "
48	J. S.	26	Female	Clackmannan	Chronic rheumatism	May 10, "	Much relieved.
49	J. W.	26	Male	Alva	Chronic enlargement of right testicle with sinuses—extirpation of testicle	June 20, "	Cured Aug. 9, "
50	W. P.	23	"	Devon village	Double fracture of tibia and fibula of left leg	" 30, "	" Aug. 11, "
51	L. U.	—	"	Sweden	Injury to tibiæ	July 25, "	" Aug. 4, "
52	W. P.	42	"	Alva	Varicose ulcer of right leg	Aug. 7, "	" Sept. 7, "
53	D. M.	15	Male	Alloa	Fracture of left thigh	" 15, "	In Hospital.
54	G. W.	56	"	Coalsnaughton	Cancerous tumour of right cheek—excised	" 23, "	Cured Sept. 4, "
55	J. M.	49	"	Alva	Epithelial cancer of lower lip—removed by excision	Sept. 6, "	" Sept. 9, "
56	H. B.	48	"	Fishcross	Necrosis of distal phalynx of right forefinger — phalynx removed	" 6, "	" Sept. 9, "
57	J. C.	20	"	"	Constitutional ulcer of left leg	" 11, "	In Hospital.
58	A. M.	8	Female	King o' Muirs	Disease of left elbow joint	" 11, "	"
59	J. S.	18	Male	Tullibody	White swelling of left knee—amputation of thigh	" 14, "	"
60	J. W.	26	"	Alva	Poriostitis of both tibiæ	" 18, "	Relieved Sept. 23.
61	T. M.	47	"	South Alloa	Compound fracture of metacarpal bones of fore and middle fingers	" 27, "	In Hospital.
62	J. F.	9	"	Sauchie	Deformity of both tibiæ—apparatus applied	Oct. 2, "	"
63	J. B.	—	"	Alloa	Disease of left ankle joint—amputation of leg	" 9, "	"
64	H. S.	—	Female	"	Chronic bronchitis	Sept. 13, "	"

Remarks on the foregoing Cases.

No. 1.—Died of Bright's disease of the kidney.

No. 2.—This patient injured by a railway waggon which knocked him down and passed over him.

No. 4.—This patient, knocked down and run over by a railway train at Menstrie, was conveyed to the Hospital, and made a wonderful recovery.

No. 9.—This patient, injured by the fall of a mass of coal upon him, made an excellent recovery so far as concerned the amputation, but cicatrization of right leg being prevented by extensive sloughing, transplantation of skin was resorted to with satisfactory results, and the wound is now healing.

No. 11.—This boy's amputation has long since healed; but he has a scrofulous diathesis, and has been long in Hospital in the hope that he may improve under nutritious diet.

No. 15.—This patient injured by falling into the graving dock, and was conveyed to the Hospital in a state of complete coma.

No. 17.—Machinery accident. Entire integuments of arm from shoulder to wrist torn off, along with the hand. Arm amputated at shoulder joint.

No. 23.—The operation of lithotomy performed in presence of Dr Gillespie, President R.C.S.E., and Drs Duncanson, Walker, and M'Fadyen, and patient made a rapid recovery.

No. 26.—This boy is gradually improving, with a stiff joint.

No. 31.—This case made an excellent recovery. It would have been impossible to have treated him properly in his own lodgings.

No. 32.—Amputation of the leg was necessary, but from the age of the patient and his irritable constitution, sloughing took place, and he died three months after the operation.

No. 35.—Out-patient.

No. 38.—Dr Duncanson's case.

No. 39.—Died of Bright's disease of the kidney.

No. 42.—This patient made an excellent recovery.

No. 45.—This lad was injured by a piece of wood, thrown out from a saw-mill, which struck him with great violence on the thigh under the right groin. An immense thrombus was the result. He made an excellent recovery.

No. 49.—This patient made a good recovery.

No. 61.—Dr Duncanson's case.

OBITUARY.—On the 27th of December, there passed from amongst us one whose shrewd but kindly face will long be missed by the bedside of many an invalid. Privileged beyond most men, Mr Charles Sidey, at the age of 75, was still apparently hale and hearty, and as indefatigable in the discharge of his professional duties as he had ever been in the days of his youth. Within a few hours of seeing his last patient, he himself was called whither there is no more sickness. Of him it may literally be said that, like the patriarch of old, "after he had made an end of commanding, ... he gathered up his feet into the bed, and yielded up the ghost, and was gathered unto his people." He has left behind him a very large circle of sorrowing friends, besides a widow and family—one of his sons, Dr James Sidey, being well known as one of the Vice-Presidents of the Obstetrical Society of Edinburgh.

THE CHRISTISON BANQUET.—On the 23d instant, Sir Robert Christison will have attained the fiftieth anniversary of his induction as a Professor of the University of Edinburgh, and it has been resolved to celebrate the occasion by a public dinner. The chair will be occupied by the Right Honourable John Inglis, Lord Justice-General of Scotland; while the croupiers will be Sir W. Stirling-Maxwell, Lord Rector of the University; Principal Sir Alexander Grant; Dr Robert Paterson, President of the Royal College of Physicians, Edinburgh; William Walker, Esq., President of the Royal College of Surgeons, Edinburgh; and Dr J. E. Fleming, President of the Faculty of Physicians and Surgeons, Glasgow: while the list of stewards comprises some of the names best known in connexion with almost every University of Great Britain. There is no man now alive who has better deserved this public recognition of his services, whether we regard them as being given in the cause of science, or in furthering the prosperity of the distinguished University which has had the privilege of so long possessing as one of its Professors one so widely known as the most lucid of teachers, a most accomplished and profound physician, and a most eminent man of science; and we anticipate for the banquet a success equal to its occasion.

SIR JOHN ROSE CORMACK.—When Dr Cormack, four years after his graduation, founded this Journal, he little thought that his later years were to be involved in so much misery and bloodshed as he has just come through. We congratulate him heartily on his knighthood as a public recognition by our Queen of his devoted services to suffering humanity—services whose value is not lessened by the fact that he voluntarily shared the starvation and misery of two sieges for the sole purpose of doing his best to relieve the sufferings of those who were not compatriots but only fellow-men. Truly he is a good Samaritan.

PRESENTATION.—William Turnbull, M.D. Edin., Consulting Physician to the Huddersfield Infirmary, several reports of which he has furnished to our pages, has just received from his friends a most gratifying testimonial in acknowledgment of his fifty-five years' gratuitous services to that institution.

THE HONOURS TO DR JENNER AND DR GULL.—It is officially announced in last night's *London Gazette* that the Queen has given orders for the appointment of Sir William Jenner, Bart., M.D., one of the Physicians in Ordinary to Her Majesty, to be a K.C.B.; and Her Majesty has also conferred the dignity of a Baronet upon Dr William Withey Gull and his heirs male.—*Scotsman*, Jan. 25.

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*On Simple Menorrhagia and Simple Metrorrhagia.* By J. MATTHEWS DUNCAN, M.D.

As these two diseases cannot be well separated or diagnosed from one another, we consider them simultaneously. Only we may premise, that our remarks are intended to apply chiefly to the menorrhagia, which is probably far the more frequent.

The words menorrhagia and metrorrhagia are very often used in a vague way, having no precise meaning attached to them. Simple menorrhagia is excessive menstruation, or extraordinary loss of blood at monthly periods, occurring in cases where there is no other uterine disease to account for the great bleeding.

Menorrhagia is to be distinguished from metrorrhagia. This latter term implies only bleeding from the womb. Metrorrhagia may or may not be menorrhagic. If it occurs at a menstrual period, or in connexion with ovulation, it is properly designated menorrhagia. In short, metrorrhagia at a monthly period, or in connexion with ovulation, when there is no other disease to account for the bleeding, is menorrhagia simplex.

We do not here treat of complicated menorrhagia or metrorrhagia. Of these diseases examples are frequent. The flow of blood in such cases if metrorrhagic, or, so far as it is excessive, if menorrhagic, may be a symptom of the uterine disease which it complicates. Thus menorrhagia or metrorrhagia may be a symptom of cancer of the womb, of ulceration of the cervix, of polypus, of fibrous tumour, of ovaritis.

As ovulation and menstrual flux are very rarely observed during pregnancy, we shall not consider menorrhagia in this state, but regard it as implying the unimpregnated condition.

Menorrhagia, thus defined, is a disease which can never be diagnosed with exactness from metrorrhagia, even supposing it is admitted that the bleeding is not a symptom of some other uterine disease. The absence of other uterine disease may be made out with a degree of assurance varying with the skill and experience of the observer; but no amount of skill and experience can give much assistance in diagnosing simple menorrhagia from simple metrorrhagia. This arises from the circumstance that we do not know, with any approach to certainty, when a woman is ovulating and when she is not. But though we cannot attain to exactness in the matter, we may in practice have considerable assurance in regard to it. We judge that the loss of blood is menstrual or connected with ovulation—that is, with temporary hypertrophy of the mucous membrane of the cavity of the body of the uterus—from circumstances which are familiar to women generally. These are, *first*, the occurrence of the bleeding at the regular and expected times; *second*, its occurrence with the ordinary symptoms usually observed in each case; *third*, the absence of any other cause of the discharge. No doubt, a flow may be menorrhagic, not merely metrorrhagic, when all these conditions are awanting, but then it cannot be diagnosed at all as menorrhagia; and, on the other hand, the occurrence of one or the concurrence of two or three of these conditions, gives a proportionally greater and greater degree of assurance as to the menorrhagic nature of the case. This distinction is one not merely of theoretical value, but may be also of practical importance for various reasons. For instance, it is thought injudicious to use means with the view of arresting quickly a slight menorrhagia whose appropriateness to a case of mere metrorrhagia would not be disputed.

A question of considerable nicety arises in regard to the less severe and more numerous class of cases of menorrhagia—namely, Is the loss of blood excessive? If symptoms of loss of blood or of chlorosis exist, are they produced by the loss of blood in menstruation? For the settlement of this point, every case must be judged to a great extent by itself. A loss may be considerable only because long continued, or only because frequently repeated. A loss may be considerable in a weak, delicate woman, which would not be considerable in a robust and healthy female. Women vary extremely in the amount of blood they lose at monthly times: a loss which in one woman would be justly regarded as excessive or menorrhagic, might in another be regarded as an ordinary amount, or even as a scanty menstruation. In every case of anxiety or difficulty, the practitioner should not be satisfied with mere reports of the amount lost, or of the number of cloths which the woman uses; but he should inspect the cloths, forming his own judgment as to the amount lost, and thus also getting an opportunity of observing the richness of the blood discharged. A chlorotic or anæmic woman discharges blood which produces a comparatively pale stain on the cloths. A menstrual flow in a healthy woman may vary as to the amount of colouring matter or globules discharged in it. Pale bloody discharge occurs sometimes in robust women, and is therefore, in itself, not a sufficient indication of chlorosis or anæmia.

Very many women attach great importance to the occurrence of clots in the discharge, and the practitioner, if not well-informed and on his guard, is likely to have communicated to him indirectly an exaggerated idea of their size. It is well known that generally no clot appears in the menstrual fluid as it comes from the vagina. As blood flows in moderate quantity through this tube, its coagulability is destroyed and its colour somewhat changed by contact or mixture with the acid mucus naturally found in this part. But small clots, insignificant so far as the amount of blood in them is concerned, are frequently observed, and, as already said, often cause great alarm. They are easily accounted for in various ways. They may be discharged from the uterus itself, where there is no acid to prevent the blood clotting. They may be formed in the vagina when mucus is deficient, or when some space occurs where a little blood may accumulate, and lie for a time without coming in contact with the vaginal walls.

Large clots are always important. They indicate a severe menorrhagia. They may be formed outside the vagina, that is, on the cloth, after the blood has quickly passed through this canal, or has passed through it while already coated with a layer of blood, protecting the inner current from contact with the vaginal walls. But such large clots are frequently formed in the vagina, and are generally discharged with peculiar feelings of faintness.

Not rarely, in cases of this kind, there are discharged flakes or films of more or less decolorized blood-clot. These the patient sometimes remarks and collects; besides, she perhaps washes them, and, enclosing them in a bottle, brings them to her physician. She probably calls them "skinny" discharges, and the practitioner may be misled into supposing they are bits of the membrane of dysmenorrhœa. From this they are easily distinguished, and frequently their larger quantity alone is sufficient for this purpose. They are generally discharged towards the end of the menstrual period, and are probably detached portions of a layer of blood which may have adhered to the wall of the vagina for some time, and have become firm and somewhat decolorized.

Menorrhagia or metrorrhagia may be produced by various causes, or are specially liable to occur under certain conditions. In early life, at the first appearance, or among the earlier returns of the menses, and again in more advanced life, when ovulation and menstruation are about to cease, the female is apt to lose excessively; and such hæmorrhages generally occur at monthly times. In women recently married, or during excess of venery, menorrhagia is not rare. Among the former it sometimes occurs as a single attack, following a brief period of amenorrhœa; and in these circumstances it is frequently mistaken for abortion. A state, which may sometimes be called relaxation of the womb, occurring in women enervated by long suckling, or by too often or too rapidly repeated childbearing, is a common cause of menorrhagia. The morbid condition of a patient labouring under fever—especially, I think, variola—is occasionally accompanied by menorrhagia or metrorrhagia. The same is true of those morbid states of the abdominal viscera, especially of the liver, which produce hæmorrhoidal congestion. One of the most frequent causes of this affection is that morbid condition of the blood, in which it is thin and watery, the woman being chlorotic or anæmic, or labouring under some form of Bright's disease of the kidneys. In this last set of cases we have a fine example of that vicious circle often observed in disease: the anæmia is increased by the menorrhagia, and the menorrhagia is increased by the anæmia. In such circumstances the coming on of amenorrhœa should be regarded as salutary and conducive to recovery; but it is certain that most women, and some physicians, would not so consider it.

Menorrhagia and metrorrhagia are frequently associated with other diseases which may or may not have an accompanying series of symptoms; but there is no symptom peculiar to the disease itself. The loss of blood in this way will produce, according to its amount and rapidity, the symptoms of anæmia, which it would be out of place here to describe. As I have already said, the amount and character of the discharges should be actually investigated by the physician himself, in every case of difficulty or anxiety.

These diseases are generally chronic, and frequently slight in degree or amount of blood lost, and diagnosis is often not carefully made. This is scarcely to be called an improper neglect, and finds an easy justification, if the patient is a virgin, on account of the disagreeable and painful character of the process of diagnosticating. But in every case which has grave character from the amount of the loss, its long continuance, or its influence on the constitutional health, a careful diagnosis should be made.

The diseases with which simple menorrhagia or simple metrorrhagia may be confounded are those uterine maladies which are accompanied by hæmorrhage; namely, abortion, ovaritis, ulceration, polypus, fibrous tumour, cancer.

It would be quite out of place to enter here on the physical characters of these various diseases, which are the grounds of the distinction to be made. These physical characters are to be found described under the heads of these diseases. But a few remarks require to be made.

The diagnosis is, in all cases, to be effected thoroughly only by a physical examination of the pelvic organs per vaginam. In cases of simple menorrhagia or metrorrhagia, the uterus is found to be of natural size, or very nearly so; of natural form; mobile; in its natural situation; and not tender. The ovaries are not to be felt, or if felt, are not enlarged or tender.

To diagnose these affections from abortion, it is necessary for the practitioner to call upon his knowledge of the signs and symptoms of pregnancy. In very early pregnancy, some doubt may sometimes remain even after a physical examination; and in most such cases the practitioner should adopt the safe course of admitting the possibility of pregnancy. Time will soon come to his aid in completing the diagnosis, and meantime his treatment may be conducted in a manner to fulfil every indication whether the woman be impregnated or not, for the treatment in either case is nearly the same. Of course, while doubt remains, and the continuance of the presumable pregnancy is desirable, the use of ergot of rye in every form will be avoided.

The presence of simple ulceration of the cervix may be suspected if there is, during the absence of the bleeding, a muco-purulent or purulent discharge, if the bleeding is long continued at one time, or if it is brought on by slight mechanical causes, as sexual connexion or digital examination. The velvety feeling of the cervix, its patulous condition, its slight enlargement, felt by the examining finger, may confirm the suspicion that ulceration is present; but a visual examination alone can make the diagnosis of ulceration certain. Yet in many cases it is not necessary nor expedient to seek to arrive at certainty; for it may be desirable to avoid the use of the speculum.

The diagnosis of polypus is generally made very easily by a digital examination. But cases occur in which further inquiry is demanded, and the method of proceeding is fully described under the head of polypus of the womb.

In diagnosing simple menorrhagia or metrorrhagia from the bleeding occurring in connexion with a large uterine fibroid, difficulty can scarcely occur. But, on the other hand, it is impossible to diagnose the absence of a small fibrous tumour which does not produce deformity of the uterus that can be felt. And, again, the diagnosis of one, not of the smallest dimensions, is often a matter of difficulty. The points to be sought, as indicating the absence of any fibroid, are natural shape and dimensions and mobility of the womb, so far as these points can be made out.

The diagnosis from cancer in an early stage may be a matter of considerable difficulty, especially if suspicion of malignant disease is not excited by the presence of pain and of thin or watery discharge when the flow of blood is absent. The circumstance that menorrhagia or metrorrhagia is frequently the first symptom of cancer of the uterus, is sufficient to keep the well-informed practitioner on his guard. It is by the physical characters of the cervix that he must be guided; and as these characters in the early stage of cancer are exceedingly variable and little known, the uncertainty of diagnosis can be easily appreciated. When the diagnosis is difficult it will be of little value. The characters chiefly to be relied on as indicating the supervention of malignant disease are the following:—hardness generally of a peculiar kind, suggesting brittleness or friability (a kind of hardness sometimes felt in a cervix which has been long maltreated by caustics); enlargement with or without hardness, but soon characterized by hardness at least in parts, and often in a sort of rim around the enlarged part; rapid growth of the enlarged part; small ulcerations, which are sometimes the result of small superficial sloughings, and which heal rapidly; more extensive ulceration, not yet of a characteristic kind, not accompanied by circumambient induration, but having overhanging unhealthy edges. Unfortunately for the poor sufferers from cancer, time will soon remove all doubt as to the nature of their disease.

The treatment of simple menorrhagia and of simple metrorrhagia is a very easy matter, so far as it goes. It is divided into the treatment before the loss begins, and the treatment while the loss is going on.

The former treatment, that before the loss begins, is only possible in chronic cases, or cases where there has been at least one previous hæmorrhage; for in any other its occurrence has not been and cannot be foreseen. It consists in the application of remedies to any condition which may appear to predispose to, or to aid in maintaining, the complaint. Congestion of pelvic vessels may be diminished by saline laxatives. Congestion of the portal system may be diminished by so-called antibilious medicines. A state of anæmia may be diminished by the use of chalybeate medicines. The general health may be improved by remedies or by hygienic regulations.

The great treatment or chief treatment is that applied during the continuance of the flow. It is of various kinds.

Mechanical treatment is most valuable, and probably as efficacious as any other. It consists, first, in maintaining rest in the horizontal position. By this means the pressure of blood on the vessels of the uterine mucous membrane is diminished, and the bleeding proportionally discouraged. This treatment is favoured by keeping the patient cool. It is applicable in every case. A second kind of mechanical treatment, that by the vaginal plug, is only applicable in severe cases in women who have cohabited, or in the very severest cases where cohabitation has not occurred. This remedy discourages the bleeding by impeding or resisting its escape. The vaginal plug generally resorted to in cases of simple menorrhagia or simple metrorrhagia is of an imperfect kind, yet often efficient: that is, it is not sufficient absolutely to prevent or arrest hæmorrhage which proceeds with any great force, as would be the case, for instance, were an artery opened by incision; but when the hæmorrhage may be, as it often justly is, likened to an oozing, its action is powerful enough to arrest it. This imperfect plugging is effected by pushing adroitly into the vagina a piece of sponge as big as the fist when not compressed, or even bigger. For the sponge, bits of lint may be substituted, and inserted one after another. It is common to dip the plug, before using it, in vinegar and water, or in a weak solution of alum. It is, no doubt, possible to explain the action of the plug, by supposing that it excites contraction in the muscular tissue surrounding the uterine vessels, which contraction will restrain the hæmorrhage; but the purely mechanical explanation is more in accordance with ordinary medical thought. The plug must be removed in twelve, or, at most, twenty-four hours, and a new one placed, if it is required. More thorough and powerful plugging is very seldom used in cases of the kind under description. To effect it, the vagina is crammed with pieces of lint so as completely to occlude it. Each piece is, when rolled up, about the size of a walnut, and is introduced separately as high as it can be pushed. If the lint is previously dipped in a solution of perchloride of iron, the plug is more efficient, probably because it soon gets hard in the vagina, and more powerfully resists the tendency to hæmorrhage. But this dipping in solution of perchloride of iron makes the plug more difficult and painful to remove.

Another kind of treatment resorted to only in extreme cases is probably also mechanical in its action. This consists in painting the bleeding surface—that is, the mucous membrane of the cavity of the body of the uterus—with perchloride of iron. A syringe, containing about a drachm of the pharmacopœial solution or liquor of perchloride of iron, is fitted to a hollow uterine probe after it has been passed up to the fundus uteri; the iron is then gently injected into the uterine cavity; only what is easily thrown in being passed. This hardens and destroys the mucous surface, and so arrests the oozing hæmorrhage. The superficial layer of mucous membrane is sometimes subsequently thrown off like the membrane of dysmenorrhœa. I have observed the application and efficiency of this remedy with the naked eye in a case of chronic inversion of the uterus, with excessive menorrhagic loss.

The local application of cold is much esteemed as a remedy by many practitioners, but I have so often seen it fail, and so often seen it apparently increase the loss, that I am very doubtful as to its real value. Cold is, with this view, applied to the lower part of the belly, the vulva, the insides of the thighs, and occasionally even to the interior of the vagina and rectum. It is done by using cloths, wrung out of cold or iced water, and frequently rewetted and reapplied, or by the use of suitable mackintosh or indiarubber bags filled with pounded ice. To the inside of the vagina and rectum cold is applied by injection of iced water, or by the insertion of pieces of ice whose edges are well rounded. This use of cold is probably derived from the application of the same remedy in post-partum hæmorrhage. When used in post-partum hæmorrhage, as it is in cases of simple menorrhagia, its value has always appeared to me very doubtful. But in cases of post-partum flooding it has another invaluable application, which is probably the parent of all the comparatively inefficient uses of it which we have described or referred to. Its sudden application, acting diastaltically or through the reflex system of nerves, will often excite an obstinately inert uterus to activity at once when friction and kneading of the uterus have failed; and this single excitement of uterine action may be sufficient. After this result of suddenness of application is gained, the repeated use of it, or its continued use, is comparatively inefficient; and it is this continued use only which is resorted to in cases of menorrhagia or metrorrhagia.

The lapse of hours or days, during which the patient rests, brings the arrestment of most cases of simple menorrhagia or simple metrorrhagia. At the same time the physician administers remedies, and while he thus comforts his patient, himself blindly supposes he is contributing to what he calls her cure. It is the so-called hæmostatic medicines that are universally resorted to in cases of this kind. There is nothing worthy of the name of evidence to show that they act. Like my brethren, I use them, and believe they have some slight influence in diminishing or arresting the discharge. They comprise the mineral acids, especially the sulphuric, ergot of rye, digitalis, gallic and tannic acids, and many others.

Dilute sulphuric acid is the hæmostatic medicine in which I have most confidence. It is often given in the form of the infusion of roses. To find what it can do, it may be necessary to use it freely. From ten to twenty drops properly conveyed may be given from four to eight times daily.

Ergot of rye and digitalis I have used in many ways, and, having no reason to prefer one way to another, must leave the details of their administration to the intelligence of the practitioner or to his caprice.

The chances of therapeutical benefit to the patient may be increased by combining the ergot of rye with the dilute sulphuric acid, or the digitalis with the same.

Gallic acid is probably more extensively used during the loss in these diseases than any other remedy. It is given in doses of from ten to twenty grains three or four times daily or oftener. It has the advantage over the mineral acids of not setting the teeth on edge; but it is, I believe, far less useful than they are. The same remarks apply to tannic acid.

ARTICLE II.—*The Treatment of Heart Disease.* By J. MILNER FOTHERGILL, M.D., Vienna.

Removal of Causation.

IN the rational treatment of diseases of the heart—an organ acting to a great extent mechanically—it is obvious that the removal of the exciting cause, where practicable, must form the first step in the treatment. Nextly would come, very naturally, treatment calculated to improve the condition of the heart itself; and, thirdly, the removal of those distressing sequelæ which usually announce its presence, and invariably embitter the last stages of the patient's existence, if not avoided by sudden death; which, however awful to the patient to think of, is not so regarded by the physician familiar with the suffering thus averted. In this order, then, the writer proposes to consider the treatment of cardiac affections according to the most recent investigations in pathology and therapeutics. It will be necessary, in order to make the subject lucid to all—those who have specially studied cardiology, and those who have had their attention directed to other subjects—to review, to some extent, the different causes in action; a mode which will probably best explain what is to be avoided, either for a time, as in less serious cases, or permanently, where the mischief done is too advanced to be repaired, or even pretty effectually compensated. Thus we find as causes, excessive exertion, Bright's disease, imperfect nutrition, nervous exhaustion, pericarditis, and last, not least, endocarditis, with its consequent valvular lesions, for which there is no repair, and only more or less imperfect compensation, of varying permanency, to be hoped for. To this list must be added syphilis, which is not only a cause of congenital malformation, but affects the muscular structure of the heart itself, as one of its ulterior actions.

Taking them in the above order, we come now to consider the effect of strain on the heart, as the result of violent muscular exertion, *pur et simple*, without any want of nutrition, or other failure, in the heart itself. This is not associated with an active or industrious life, with exertion prolonged as a daily task, a life-long duty, but with violent temporary exertion, the consequence of labour in some forms of industry, or in voluntary effort, as in the gymnast. This cause is seen largely in action in hammermen, who have to put forth all their strength and endurance during the brief period of time that heated iron remains sufficiently hot to be worked. During the process of heating the man is resting, true, but the vascular excitement and heaving respiration tell how severe is the strain to which the viscera have been subjected. Let us consider what the *modus operandi* is here. Firstly, there is violent action of the muscles of the upper limbs, which compress the arteries, and even act more or less across them (the musculo-cardiac function of Wardrop), and form a decided obstruction to the flow of blood from the left ventricle. The same action of the muscles, on the other hand, tends to drive the venous blood towards the heart. The blood is thus collected in the venous centres—viz., the venæ cavæ, right heart, and pulmonic circulation. The chest is also more or less fixed, as having points from which the muscles work. When each "heat" is over, on examination, the "striker" will be found panting, with violent action of his heart, and bounding pulse, gradually subsiding into a balance of the arterial and venous circulations, until the next effort, which is not far distant.

It is obvious that here there is, of necessity, a strain put on all parts, from the obstructed lesser arteries backwards to the aorta, left ventricle, and the truly venous parts, the pulmonary vessels, and right heart. The morbid results manifest themselves in various parts. For instance, in dilatation of the aorta, with atheroma in the distended endarterium; in thickening and distorting the aortic valves, driven together with excessive force; in yielding of the left ventricle; and inevitably in dilatation of the pulmonary artery, with dilatation and hypertrophy of the right ventricle. The last is almost unavoidable, and tends to perpetuate the mischief inaugurated in the left ventricle, thus—the enlarged and altogether bigger right ventricle sends a greater mass of blood through into the left side, and thus the left side is filled under greater pressure, a well-known cause of dilatation of the ventricle. Its contraction, in turn, throws a larger volume of blood into the aorta, and keeps up the condition of over-distension. This excessive aortic distension leads to a fuller supply of blood to the coronary arteries, and full nutrition of the heart. For a time this condition is maintained, but sooner or later the action changes into some distinctly morbid condition. The distended aorta may be ruptured by a blow, and a true aneurism formed by cracking the brittle inner coat;[1] this distension may go on to atheroma and its consequences; the aortic valves may become diseased and imperfect, or the muscular walls may yield.[2] The disease of the aortic valves has a curious effect on the muscular walls. Hypertrophy, and that to an unusual extent, supervenes, but it is not permanent. Mauriac[3] has most ingeniously shown, that when the aortic valves become imperfect, the blood column in the aorta, no longer perfectly arrested in its backward course by the semilunar valves, does not, on the arterial recoil, perfectly fill the coronary arteries, and sooner or later the hypertrophied walls become degenerate from imperfect nutrition. The changes in the arterial system act on the parts behind them; but the venous system not unfrequently is itself the first to yield. Thus, from the pulmonic congestion comes tuberculosis, emphysema, etc.; from yielding of the right ventricle we have dyspnœa on slight exertion, palpitation, and true cardiac asthma. This condition is common among hammermen, colliers—especially when working in constrained positions, which can only be maintained for limited periods, which, however, test their endurance—among gymnasts, etc. When, then, any of the earlier symptoms of heart failure, or failure in the other organs, manifest themselves, it is only too obvious that the form of labour which evokes the failure must be abandoned; for the causes which could induce disease in the healthy heart must have a sadly deleterious action when that organ is commencing to yield, and the various forms of compensation to become imperfect. No measures, however successful in affording relief to symptoms, can be expected to endow these organs with the virtue to resist the stress with impunity. By rest, where practicable, and a change of labour—some new occupation not necessitating violent effort, where labour in some from is unavoidable—the changes in the muscular walls may be greatly modified (in proof of this can be adduced the passing away of the hypertrophy of the left ventricle of pregnancy on parturition[1]); and a return to the normal state more or less completely attained. But if the muscular walls have grown equally with the demand on them, and the changes have commenced in the arteries, nothing known in the present state of medicine can in any way restore them. Here the removal of the cause can alone promise anything, or hold out the hope of a prolonged existence.

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[1] Clifford Allbutt, in St George's Hospital Reports, 1871.

[2] Myers on Diseases of the Heart among Soldiers. Alexandra Prize Essay.

[3] Mauriac, article "Cœur," Nouveaux Dictionnaire, Paris, 1868.

In considering the mode of causation of the heart disease which follows changes in the kidney, great caution is necessary. So common, however, is the change in one organ, on the occurrence of disease in the other, that there can be little doubt as to the fact; as to the mode of production, we may truly be said to be in troubled waters. Soon after Bright published his observations, two divisions of thinkers ensued: one maintaining that the kidney-changes were consequent on the heart disease, and were, in the phraseology of the day, inflammatory products of congestion, or an infiltration of serum capable of being organized into a low form of cell-life; the other maintaining, with Bright, that the heart disease was secondary. Of course, the asthenic congestion consequent upon heart-failure adds to the primary renal trouble, and often profoundly modifies the symptoms; or primary heart-mischief may, by asthenic congestion and its consequences, lead to disease in the kidney, as a result. Renal disease is commonly followed by changes, especially in the left ventricle, or inversely; many cases of heart disease have been preceded by evidence of disease in the kidney, also when renal mischief is established, the changes in the heart follow sooner or later, usually so soon, and so certainly, that the connexion is universally allowed. Various opinions have been, and are yet, held on this subject. The chief thinkers and writers have been Bright, Traube, and George Johnson. Bright thought the flow of the blood was impeded by chemical alterations in it, and thus changes inaugurated. Traube maintained, and yet maintains, that the changes occurred in cirrhosis of the kidney (Nierenschrumpfung), and that the shrivelling, by obliterating many of the renal vessels, led to obstructed flow through the renal artery; and that that again affected the whole arterial blood current, and caused changes in the left ventricle. George Johnson further observed, in this condition, an hypertrophy of the muscular coat of the arterioles generally, and evolved this theory. The walls of the arterioles are largely muscular, and have a "stop-cock" action in altering the calibre of the arterioles, and thus permitting a larger or smaller bulk of blood to pass to the various tissues on the arterial recoil. The retained urine salts in the blood poison it, and the arterioles contract to prevent the entrance of poisoned blood into the tissues. This constitutes an obstruction to the blood current, and changes in the left ventricle are inaugurated. The position of the two theories stands respectively thus:—

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[1] For information on this interesting point, the reader can refer to the observations of Larcher and Ducrest in the Archives of Medicine, Paris, 1859.

TRAUBE.	JOHNSON.
1. Contraction of the kidney.	1. Changes in the kidney, with retention of urine salts.
2. Obstruction to the blood stream.	2. Contraction and hypertrophy of arterioles.
3. Hypertrophy of the left ventricle.	3. Obstruction to the blood stream.
	4. Hypertrophy or dilatation of the left ventricle.

For my own part, I think the explanation given by Johnson better accounts for the various morbific steps, and includes the alteration in the walls of the arterioles, which, it is rather strange, seems unknown to German observers. There are difficulties in the way of each explanation, but Traube's idea of the obstruction to the renal flow being able to react on the whole circulation, is opposed by the whole history of compression or obliteration of arteries equal to the renal artery in bulk.[1] The chief objection, it appears to me, to Johnson's view, is as to the contraction of the arterioles to shut off the blood supply to the different tissues. It commits the holder to a theory of a kind of intelligence in the arterioles, and a perversity in the ventricle. The arterioles close to prevent the entrance of the blood into the tissues, and the heart strengthens to overcome them and force it in. It is easier to comprehend the changes on a slight modification of Johnson's view—viz., that the irritant action of the urine salts excites spasm and consequent hypertrophy of the muscular tunic of the arterioles, and this leads to obstructed flow, and changes in the left ventricle, hypertrophy or dilatation; the condition of the patient being better when the power is there to produce hypertrophy, and drive the blood into the textures, than when dilatation results, and the power to counteract the arteriole spasm is wanting. That the presence of a blood-poison in the tissues is productive of disease and suffering there is no doubt, as, for instance, in genuine gout, arthritis, muscular rheumatism (so called), sciatica, bronchitis, etc. Still, atrophy from spasm is worse, as in muscular wasting, degeneration of the heart walls, etc., from spasm in the arterioles, and impaired nutrition. The connexion of pain with different blood-poisons, as in gout, rheumatism, syphilis, malaria, lead-poisoning, etc., fully justifies the aphoristic sentence of Romberg: "Pain is the prayer of a nerve for healthy blood." The question is growing rather long, but it is of great importance for successful treatment that the different steps in the morbid process be clearly understood, and the dependence of one link in the chain on the preceding one be appreciated. When, then, in this chronic condition we have an exacerbation of the disease, there is an accumulation of the blood-poison, spasm of the hypertrophied walls of the arterioles, and palpitation (the evidence of laboriousness) of the hypertrophied left ventricle. No reader of much experience will feel any difficulty in recalling to mind numerous instances of sudden coldness of the hands or hand, in many elderly persons, with more or fewer of the symptoms of Bright's disease, especially when not feeling so well as usual. It is exactly the same phenomenon, except in causation, as the cold hands or feet in hysteria, where spasm of the arterioles, palpitation, etc., is common. The treatment, by removal of causation, of the cardiac troubles consequent on kidney mischief, which will be found most effectual, will be the removal of the accumulation of the products of histolysis, since treatment of the kidney itself is impossible.

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[1] Bamberger has also brought forward this argument against Traube's theory. Flint also rejects it.

For the achievement of this we possess two totally different means—either action on the kidney, such of it as remains useful, or the bringing of other organs into increased action; usually both combined will be found most effectual. Thus, an active purgative, by exciting the bowels, will aid in the elimination of the offending material;[1] diaphoresis is an excellent form of wielding this power of other organs to aid in the elimination of material somewhat special to another organ.[2] The most persistent form which the products of retrograde tissue metamorphosis assume is that of uric acid; and experience has told me that potash and buchu, with colchicum, better relieve palpitation and the other evidences of heart disturbance, in Bright's disease, than did digitalis, belladonna, etc., without this truly specific treatment. The retained uric acid, which can only exist in the alkaline blood, in union with some base, unites with the potash, and in this highly soluble condition passes readily out through the kidneys by dialysis. The action of colchicum and buchu is to increase the elimination of the urine salts by acting on the renal secreting cells, and the consequence of this treatment is a decided increase in the specific gravity of the urine, not attained by diminution of its bulk. This treatment of the heart trouble, consequent on renal impairment, by removing the excess of waste material in the blood, is a most important point in the checking, and, to some degree, arresting the morbid processes already instituted. There is no doubt that the constant presence of uric acid in the blood still further aggravates the kidney mischief already existing. The question of the retention of urea in the blood in acute congestion of the kidney and uræmia, does not bear on the subject under discussion here.

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[1] See article "Secretion," by Carpenter, in Todd's Cyclopædia of Anat. and Physiology, for the explanation of the power of one excretory organ to aid another.

[2] Dickenson on Albuminuria, p. 98.

No treatment, however, should be persisted in until anæmia be produced. Defective nutrition is one of the great primary sources of heart failure, and as a secondary factor it very commonly hastens the setting in of loss of that compensatory hypertrophy, which has hitherto ameliorated the mischief done. The tendency of Bright's disease is towards imperfect nutrition, and when this is threatening the treatment must be accompanied, or followed, by the administration of iron. For this purpose the potassio-tartrate is eminently suited, and goes well with the bicarbonate of potash. The effect of blood-poisons of all kinds is decidedly to check blood-formation, as for instance, Bright's disease, syphilis, malarial poisons, lead, etc., and their elimination by their respective specifics, potash, mercury, quinine, iodide of potassium, etc., is the first step to be attended to in the treatment of the affections to which they give rise. In all these conditions the addition of iron, to aid in the formation of new blood, is of great service. In cases of heart failure all conditions of anæmia should be carefully examined and submitted to the treatment adapted to each. Thus, leucorrhœa and menorrhagia frequently cause the anæmia which leads to imperfect nutrition and consequent heart failure. (These affections are, however, not uncommonly the consequence as well as the cause of heart impairment. They are frequently the consequence of the general venous congestion which results from cardiac debility; and these should be met as much by improvement in the heart itself as by measures intended for their special relief.—*Von Dusch's Lehrbuch von Hertzkrankheiten*, 1868, p. 195.)

Dyspepsia, hæmorrhoids, and other debilitating causational conditions must be removed as far as practicable. Imperfect nutrition leads to loss of propulsive power, the ventricle is not sufficiently emptied at each systole, a certain amount of blood remains in the chamber, the blood is poured from the charged vessels into a ventricle already partially filled, and dilatation results. There is a loss of balance betwixt the blood to be driven and the power to drive it. Flint (Diseases of the Heart, 1870) says, "The combination of anæmia and enlargement of the heart is to be prevented, if possible; and, if it exist, the anæmia, if possible, is to be removed by appropriate measures of medication, diet, and regimen. Irrespective of this condition of the blood, all agencies which tend to weaken unduly the force of the ventricular contractions are contraindicated. In proportion to the weakness of the heart will be the tendency to dilatation rather than to hypertrophy. So long as hypertrophy predominates, the patient is comparatively safe" (p. 77). What gives this direct expression even more force is, that here he is speaking of the treatment of hypertrophy. When dilatation is manifesting itself it becomes doubly important to avoid any tendency to anæmia. And where this tendency does not yield to treatment, but manifests an inclination to persist, the patient should be remorselessly confined to bed for a time, to reduce to a minimum the calls on the nutritive processes.

Pretty much the same effect upon the heart as is produced by anæmia, is produced by nervous exhaustion, only here the action is more special upon the heart. The effect of nervous exhaustion is largely located in the organic nervous system, and the viscera supplied from it. The effect of this nervous exhaustion is to impair the sensitiveness of the cardiac ganglia, upon which depends cardiac contraction. The sensation of distension of the muscular fibres is recorded by the cardiac ganglia, and contraction follows, as in all hollow or spherical masses of muscular fibre. When, then, from impairment of sensibility a condition of over-distension results, there follows imperfect power of contraction, and thus dilatation is inaugurated. This imperfect contraction is thus productive of dilatation and other consequent troubles. The ventricle not thoroughly emptied is already, on diastole, partially full, it is soon full to over-distension from the pouring in of blood from the gorged auricle and veins behind : imperfectly emptied, it is soon over-full, and frequent imperfect contractions take the place of normal contractions. This condition not only tends to perpetuate itself, but sooner or later to lead to degeneration of tissue. A small bulk of blood only is thrown at each ventricular systole into the aorta; it is imperfectly distended, and consequently its recoil is diminished; this aortic recoil is the propelling power for the coronary arteries; the lessened flow diminishes the nutrition of the heart-walls, and consequently degeneration results. At the same time, too, every additional contraction in the minute diminishes the heart's period of rest. All causes, then, which increase the rapidity of the pulse, and especially when this increase in frequency is accompanied by loss of power in each pulsation, should be avoided, as excitement, anxiety in speculation, excessive drinking, the denial of sleep, especially in the horizontal posture, tobacco-smoking, and, certainly not to be omitted, the excessive use of tea. The effect of agents which lead to nervous exhaustion and increased frequency of heart contraction, with loss of quality, is strictly analogous in effect to imperfect nutrition or anæmia. The complete or partial removal, where complete removal is not feasible, of these causes is imperatively demanded in the treatment of the heart failure which results from them.

Pericarditis leads to changes in the heart itself either by the presence of fluid compressing the heart, or by adhesion of the pericardium along the track of the coronary vessels, and imperfect nutrition of the heart from impeded blood-supply. This is by no means uncommon (Rokitansky). The adhesion does not admit of alleviation, but it is a strong argument in favour of taking every care to prevent or arrest pericarditis in its acute stage. The effused fluid may be reduced by absorbents, blisters, and, when necessary, by paracentesis.

Endocarditis when acute is usually associated with acute rheumatism, and is therefore most effectually treated by the measures which are found most potent in rheumatism. But chronic endocarditis is, like atheroma, an affection of another character, though it may be the continuation of the acute process. It is mischievous in many different ways. It may deform or contort the valves; it may occasion obstructive disease or insufficiency, or both combined; it may proceed, from an atheromatous patch on the heart-wall, to ulceration, and the formation of a true ventricular aneurism; or it may be located in the aorta and large vessels chiefly, and lead either directly to alterations in the heart-walls, or indirectly by the establishment of aneurism. Its causation, then, is of great importance, and endarteritis deformans will ensue whenever the brittle endocardium is exposed to strain or extra distension. Thus, it is associated with the first section of this paper, excessive muscular exertion or strain. So it is very commonly associated with the chronic form of kidney mischief. Betwixt the hypertrophied muscular coat of the arterioles and the hypertrophied heart the intermediate vessels must be subjected to increased distension; that we have increased arterial tension is evidenced by the increased bulk of urine, showing the increased pressure on the glomeruli of the kidney, one of the most invariable symptoms of granular kidney. This constant increased tension in itself leads to the production of connective tissue in excess, while, at the same time, the endocardium is constantly in contact with impure blood, and it is possible, though not demonstrable, that it receives its nutrition partly by imbibition as well as from the vasa vasorum. Whether this last be so or not, the endocardium is exposed to excessive distension, and is fed with blood altered in its properties, in these conditions of chronic kidney disease, and so we cannot feel surprised at its becoming itself altered and diseased. Not only are atheromatous patches found, but a more or less general condition of atheromatous degeneration is usually present. The association of these morbid processes is too constant to admit of our explaining it on the ground of accidental coincidence; if not standing to each other in a causational relationship, they are, at least, the sequelæ of some morbid condition, common to each as a provoking cause. This condition has purposely been removed from the section of the relation of alterations in the left ventricle and disease in the kidney, and placed under endocarditis, as being the result of a blood-poison on the endarterium or endocardium. The question of the chronic disease of the large vessels and lining membrane of the heart does not admit of being fully answered yet. In considering the "atheromatous process," Oppolzer gives the causes, as classed by various writers, as gout, rheumatism, carcinoma, abuse of alcohol, syphilis, etc.; and the question of connexion is not answered in the negative by our inability to explain the mode of operation. Apparently, however, uric acid seems to have a decided tendency to produce the development of connective tissue in excess by its irritant action, and in effect is closely allied to alcohol as a tissue irritant. The avoidance of these two agents is very important in heart failure associated with atheroma. Not that alcohol should therefore be absolutely forbidden in this condition, but such an amount only should be allowed as may fairly be supposed to be consumed, and no excess left to be eliminated as alcohol, and further irritate the kidneys. These various causes, above enumerated, of atheroma affect too the substance of the heart itself, as cancer, tubercle, syphilis, etc. This last alone can be regarded as amenable to treatment, and even that is questionable. Still, when, as Lancereaux has shown, heart failure comes on with or after the usual manifestations of syphilis (constitutional), a presumption exists in favour of the presence of gummata within its substance; and this too is rendered more probable if occurring in a comparatively young person, and especially if there be no sign of valvular mischief. Here antisyphilitic treatment may tend to arrest the further development of the gummata, but, as Von Dusch justly remarks, it is impossible to amend the masses of connective tissue which remain, or to convert them into muscular fibre.

This review of the causes which lead to heart failure will demonstrate, to some extent at least, the necessity for including the avoidance of causation, either primarily or secondarily, as an aggravation to the already existing mischief in the treatment of heart affections. The means by which we may act directly upon the heart itself next claim consideration; and afterwards the rational treatment of the sequelæ, whether the case admits of hope, or merely admits of diminution of the suffering entailed. It is not possible to add much to the means already at our command for this last purpose, but by consideration of their action, and the varying results to be looked for, according to the special morbid condition of the heart, it may be possible to so arrange the subject as to be practically useful.

Means of acting on the Heart itself.

The means by which we may act upon the heart itself are necessarily of three kinds—those acting on it from without, *i.e.*, affecting it regionally; those acting on it from within, the reduction of the bulk of blood circulating in it; and those which act upon its muscular walls directly. The action on the heart by pressure around it is only too obvious. This is most especially seen in the accumulation of fluid in the pericardium. But equally and much more commonly visible is the effect of pressure upon the abdominal surface of the diaphragm, and its bulging into the thorax, thus diminishing the space within which the heart moves in its action. The heart varies in bulk in systole and diastole, betwixt full distension and the chambers when emptied. It is obvious, then, that while the bony parietes of the thorax remain *in statu quo*, and the diaphragm is pushed upwards in the neighbourhood of the heart, the heart itself must be affected by that pressure. That it is so is a fact well known in clinical experience, even in healthy hearts, as in accumulations of gas, solids, etc., in the stomach and colon: how much more they affect a heart already impaired is equally well known. The sense of discomfort, shortness of breath, and palpitation, which are found very unpleasant in a sound person, is intensified in a person with a diseased heart: and this more especially when the right ventricle is involved. The accumulation within the colon or stomach of gas must be met by carminatives, stimulants, diffusible or other; and in favour of ammonia has been urged a chemical argument. It has been asserted that a reduction of the bulk of gas takes place by its union with the free ammonia, converting it into a carbonate; whether this is so or not, it is certainly a useful stimulant in this condition. When the accumulation is solid, purgatives, and in acute dyspepsia emetics, are useful—ipecacuanha or sulphate of zinc, or both combined. Turpentine stupes are, too, desirable. In connexion with this subject is involved that of the relief afforded by retaining the sitting posture, or being propped up in bed, in heart disease, and especially in the acute paroxysms of dyspnœa. There is no question as to the fact. The explanation is not so simply answered; but, after deliberate thought, it appears most probable that the relief is not in the respiratory passages being so brought or kept in a straight line, as has been asserted, as when the patient seeks relief by sitting on one chair, and resting his arms on the back of another (here the fixing of the arms enables the auxiliary muscles of respiration to act more efficiently), or desires to be propped up in bed, or dies sitting in a chair. At other times, when seized with an acute paroxysm, the reclining patient jumps up in bed, gets on his or her hands and knees, retaining this posture for hours, uncomfortable though it is at other times. It lies in the regional relations of the diaphragm. When in the reclining posture, the contents of the abdomen do not fall from the diaphragm by their own gravity, but press equally on the diaphragm as on the other parietes; and this, too, markedly when any load or pressure exists in the stomach or colon. This is at once relieved by elevating the upper portion of the body, or in the attitude on hands and knees. Whether this is all the explanation or not, there can be no question that it is part of it. All pressure from without upon the heart impedes its action, and on its removal the heart is relieved.

The question of action upon the heart from within, by reduction of the bulk of blood in the venous centres, and especially during distension of the right ventricle, has been discussed and even debated only some few years ago. Most members of the profession will remember the memorable discussion on bleeding betwixt Dr

Markham and Sir Thomas Watson on "The Change of Type in Disease," and will also be more or less familiar with the more recent elaborate paper "On Bloodletting" by B. W. Richardson, F.R.S. The question briefly is the relief of over-distension of the right heart by the withdrawal of blood from the circulation. In cardiac asthma the right ventricle is in over-distension, and at the point of paralysis therefrom, in its inability to drive the blood through the capillaries of the lungs. This condition is unfortunately very frequent in the course of chronic heart disease, and may arise from diaphragmatic pressure, when in the horizontal position, or from spasm of the pulmonary arterioles, etc. Here, again, the question of the relief afforded by the withdrawal of blood generally or locally is not one about the fact: that is unquestionable enough; but whether the immediate danger would justify resort to the measure in the face of the danger looming of oncoming anæmia. A few ounces of blood are not much to a healthy person, but amount to a great deal in a person with advanced heart disease. Consequently, the tendency of practice is to draw blood away from the venous centres by means which do not necessitate its removal from the system. Thus, one method much resorted to is the diminution of the bulk of blood by the administration of purgatives. Another and more speedy plan is the dilating of the innumerable capillaries of the skin by the application of heat, of irritating materials, or both combined. The application of mustard poultices and blisters are measures of no recent adoption; but the advance of knowledge has demonstrated that the effect desired can be more quickly and surely attained by the application of hot poultices around the trunk, or as far as is practicable. They at once dilate the capillaries of the skin, and thus furnish relief to the gorged venous centres: thus acting in a manner precisely similar to the withdrawal of blood by bleeding. Mustard may or may not be added to aid their efficiency by its irritant action, or by its action as a general stimulant. The use, then, of this method of unloading the venous centres is in practice preferable to that of withdrawing blood from the organism for ever, as is unquestionably the case with general or local depletory measures, and is thus to be resorted to first; but the question of resorting to further measures when these, combined with the administration of internal remedies, fail, is whether the emergency is sufficiently great or not. Several times has the writer stood, lancet in hand, some time, carefully watching the action of the other measures, and, on their success, returned the lancet unused. Though the relief of this condition by venesection must be seen to be appreciated, still the immediate advantages must be weighed against the loss of that blood permanently. No doubt, in practice, local bleeding by leeches is largely resorted to, and so, but for the natural objection to the cutting of the skin, would be wet-cupping; dry-cupping is not so useful here as the covering a larger surface with hot poultices, however useful it may be when applied to a localized surface to divert to the skin the blood of an artery whose internal distribution supplies an internal organ affected, as over the loins in kidney congestion, or in costal pleurisy, etc. In addition to these measures of acting on the heart from outside and within it, is the question of acting on the heart itself by means of remedies. Can we increase and diminish the completeness and power of the ventricular contractions? is a question which can now be answered in the affirmative. There do exist agents which positively stimulate the heart-walls into increased contraction. Thus the condition of the heart-walls, as regards distension, is brought within the reach of remedial agents administered internally. The effect of such an agent in the condition described immediately above, is to cause the ventricle to contract more perfectly; and thus it is not only relieved from the danger of paralysis from over-distension, but aided to recover itself. No sedative to the heart is needed here betwixt its distension and the risk of paralysis from the carbonic acid of the highly venous blood within it; it is only already too powerless; but some agent which will enable it to contract more efficiently. That we are in possession of such agents is certain. The chief one in use is digitalis. The names of Sanders, Orfila, Traube, Dybkowsky and Pellikan, Handfield Jones, Hilton Fagge and Stevenson, Reich, Niemeyer, Winogradoff, are intimately associated with this subject; and though the earliest impression of its action was that it was a sedative, because under it the heart grew quieter, still, from the work of Withering,[1] in 1785, down to the most recent investigation by the writer,[2] the idea has gained ground that this quieting of the heart's action arose from its being endowed with more power. Allied to it are other agents, as the scilla maritima, associated with the names of Fagge and Stevenson; the dajasek, or arrow-poison of Borneo (Braidwood), unquestionably belladonna, associated with the names of Meuriot, the writer, and notably Dr John Harley; the alkaloid of veratrum, advocated by Trousseau, Aran, Vocher, and Horatio Wood; caffeine, Jacquoud, the writer; and probably scoparium; others of the scrophulariaceæ,[3] and possibly some of the ordeal poisons of the tropics. Physiological experiment demonstrates what clinical observation had long expected, that the effect of digitalis is to produce more perfect action of the ventricles. The condition of complete paralysis by aconite, identical with that of the over-distended heart, was quickly relieved by the administration of digitalis; and not only so, but that previously paralyzed heart, in extreme distension, can be brought to a standstill in the opposite condition of complete contraction, if enough of digitalis be administered. In practice, then, digitalis can be administered with excellent effect in this condition of over-distension of the right ventricle, and has been so used. In all conditions where the muscular walls of the heart are unequal to the demand on them, whether from valvular disease or other cause, digitalis can be given, not only for a time, but continuously and uninterruptedly for years, with excellent effect. The continuous and persistent administration of digitalis in cardiac inability not only secures the immediate effects of improved ventricular contraction, but has an ulterior effect upon the heart itself; and oftentimes the heart, getting further and further distended and enfeebled, sending less and less blood into the aorta at every systole, and thus eliciting less aortic distension and consequent recoil, and with that diminished recoil an impaired coronary circulation and supply of blood to itself, thus ensuring more complete muscular failure, is, by digitalis, enabled to contract more perfectly, to elicit better aortic distension and recoil, better supply of blood to itself, and improved nutrition; while every contraction fewer in the minute is adding to its period of rest. Thus, not only can a downward progress be arrested, but even a career of improvement inaugurated, which in simple dilatation or distension may result in perfect restoration to health. Where this cannot be accomplished, not only may life be made more bearable, but even be prolonged; and the question of the importance of prolonged life in individuals is one the importance of which has been pointed out by Quetelet (Sur l'Homme); while that importance itself is materially enhanced by combining with it a power for more or less labour, corporeal or mental; and that that is within the clear limits of possibilities is no therapeutic fiction, whatever doubts may be cast by some on the possibility of perfect restoration to health. Even in the worst cases patients cling to existence, and something may be done to relieve the suffering which results from heart failure by thus acting on the muscular walls by digitalis.

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[1] On Foxglove. Birmingham, 1785. Leipzig, 1786.

[2] The Hastings Prize Essay, 1870. "Digitalis: its Mode of Action, and its Use." H. K. Lewis, 1871.

[3] Some Experiments by Dr H. Barnes of Carlisle, and Dr J. Wallace of Dalston, now of Liverpool, on other members of the Scrophulariaceæ, may some day see light.

Along with this direct treatment of the heart itself may, and often must, be combined diminished call for exertion on its part; rest is imperative for a time, or more or less permanently, and the improvement in the coronary circulation must be supplemented by improvement in the blood itself. Iron, cod-liver oil, arsenic, and the other means of improving blood-formation, and from it again improved nutrition, are aided by the vegetable tonics strychnine, quinine, etc., which improve the digestive powers of the stomach. As to iron, Fuller says that the continuous administration of iron for three or four years has resulted in the removal of every physical sign and rational symptom of dilatation. Thus the heart itself has a power of recovery when furnished merely with an improved blood-supply without the aid of means acting directly upon itself. In practice, the combination of different measures may be indicated or demanded, and some of the formulæ most used by the writer were these—

1. ℞ Pot. bicarb. gr. v. or x.
   Ferri pot. tart. gr. v.
   Tinct. digital. ♏ x.
   Inf. calumb. ℥1, ter in die.
2. ℞ Tinct. digital. ♏ x.
   Sp. chloroformi, ♏ xxv.
   Inf. buchu, ℥1, ter in die.
3. ℞ Tinct. digital. ♏ x.
   Liq. strychnia, ♏ v.
   Tinct. fer. mur. ♏ v. or x.
   Aquæ or inf. quass. ℥1, ter in die.
4. ℞ Tinct. digital. ♏ x.
   Sp. æth. nit. ♏ xxv.
   Tinct. sem. colch. ♏ x.
   Inf. buchu, ℥1, ter in die.
5. ℞ Pulv. digital. gr. ½.
   Pulv. ferri sulph. exsic. gr. ¼.
   Pulv. pip. nig. gr. 1.
   Ext. gent. or pil. al. et myrrh, q. s. 1. bis in die.
6. ℞ Tinct. belladonnæ, ♏ xx.
   Tinct. nucis vomicæ, ♏ x.
   Mist. camphoræ, ℥1, ter in die.

These different formulæ may each be useful, and the second is especially agreeable in simple cardiac debility: the first is better when washed down with a tumblerful of water, and with the pills a patient may go away on a visit very comfortably. Thus by digitalis we can, more or less, according to the nature of the case and the integrity of the heart-walls, act upon a heart whose contractions are becoming incomplete. This is the centre point of action upon the heart directly; for we must all be only too painfully aware that any action on diseased valves is beyond the reach of remedies, in this age as yet. But whether the origin be valvular failure or other cause, as long as the heart can contract completely a better state of matters is maintained than when the heart-walls fail. It is this failure of power, this inability to contract completely on the part of the ventricles, which is the thing we have to dread as being the end, or at any rate the beginning of the end, of the case. It may not be out of place here to add that in electricity we possess a power that may be of great service in the treatment of heart failure. The effect of a feeble electric current is to increase the force and lessen the frequency of the heart's action: as the writer has observed with a small Stohrer's battery, one pole placed over the heart and the other to the nape of the neck.

Schiff, Rosenthal, and others have found this application to the vagus to increase the force and frequency of the heart's action.

In some cases of palpitation, both in organic disease and mere disturbance of the heart, the administration of morphia by the subcutaneous injection, so fashionable now, has been practised, and not without success. But the cases ought to be clearly distinguished. We have no evidence yet that morphia aids the heart to contract, but we have reason to suppose that it relaxes spasm. It is, then, in these cases where spasm of the arterioles is necessitating greater exertion in the heart-walls, in consequence of the impeded flow, and where palpitation is the evidence of that laboriousness, of that more or less inability of the heart to force forward the blood-column, that morphia does good. That this condition may be relieved by morphia seems intelligible enough, but is even better met by the sixth formula. Even when the palpitation occurs in structurally diseased hearts in consequence of spasm of the arterioles, this plan may be successful; but in the exacerbations of blood-poisoning in kidney disease it is contraindicated by the intolerance of opium, equally with mercury, which is exhibited by those suffering from chronic Bright's disease. In a case where morphia was badly borne, B. W. Richardson placed a mustard blister on the neck "so as indirectly to influence the sympathetics," and the relief afforded was immediate. (*Discourses on Practical Physic*, p. 93,—1871.)

Rational Treatment of Sequelæ.

The third and last division of the treatment of heart affections is only of less importance than the preceding divisions, because it does not so much prevent as alleviate evils. Still, when from inability in the centre of the circulation we have decidedly venous congestion, and, from it, again, a sort of re-balancing of the systems arterial and venous, we have the different viscera in a state of asthenic congestion: a condition unfavourable to the performances of function. Thus, we have gastric catarrh, congestion of the liver, diminished flow of urine, and tendency to disease of the kidney, as the consequence and not the cause of heart disease, in females uterine discharges menorrhagic or leucorrhœal; so we have effusion through the lining membrane of the air-passages, and a flow of fluid, chronic bronchitis or bronchorrhœa, œdema of the lungs, etc. etc., and finally general anasarca. Now, it is obvious that where we hope not only to relieve matters, but to inaugurate improvement, we must relieve the viscera from a condition unfavourable to improved nutrition. For this purpose we can use purgatives, diuretics, diaphoretics, and even expectorants: all agents affecting the secretory and excretory power of the different organs.

Purgatives, and more especially drastic cathartics, have been long resorted to with the intention of calling out the action of the bowel; and the different effect of two drachms of pulv. jalap. co., with a grain of gamboge in it, on a patient with advanced heart disease, to its effect on a healthy person, speaks volumes. The latter would feel decidedly depressed, but the sufferer from heart disease feels enlivened, sprightly, and altogether improved. Four or five copious watery evacuations have relieved his venous congestion, relieved his distended right ventricle, and improved his pulse, while the relief to the cerebral congestion manifests itself in his improved spirits. This method of acting on the viscera in the congestion of heart failure is deservedly a favourite one; and for the purpose of exciting free catharsis the usual means are pulv. jalap. co., pulv. scam. co., elaterium, and gamboge. Gamboge rubbed up with bitartrate of potash and black pepper, or other carminative, is a capital cathartic. All may have to be used in turn, as one form soon loses its efficacy. Chronic diarrhœa is not in this condition to be arrested, except by action on the skin, unless it is clearly threatening the patient's existence: it is a natural drain, as much as eczema in hydrops. Purgatives are often thought to have a diuretic effect in heart affections; this is the impression of experience as a fact. Really, the improvement in the circulation is followed by freer circulation through the kidneys and better arterial tension, and consequently there is better diuresis of water.

Diuretics have not only always been resorted to in the treatment of dropsy, which was, until recently, regarded as a disease *per se* and not a sequel, but the improved or unaltered flow of urine has been adopted as a sort of test of the efficacy of the remedial measures resorted to. Long before the experiments of Paff, Winogradoff, Handfield Jones, and Brunton, on arterial tension, popular observation had learnt that an increased flow of urine indicated an improvement in the patient's immediate condition in dropsy; and it is, therefore, in the agents classed as diuretics that we find digitalis, squill, belladonna, etc., which we now know exercise their diuretic action by virtue of the increased arterial tension, the result of more perfect ventricular contraction. The water excretion by the kidneys is a question of hydraulics—a purely mechanical result of the pressure of the blood on the thin-walled glomeruli of the Malpighian bodies. When the arterial blood is driven in but feebly, and the venous is almost stagnant, we find the bulk of urine very low indeed: but its sp. gr. may be very high, for the bulk of urine and the elimination of solid excreta by the renal secreting cells bear no necessary relation to each other. No doubt, too, certain other agents act as diuretics, as juniper, turpentine, potash nitrate, nitric æther, etc., by their being direct stimulants to the kidneys, and thus inducing an increased flow of blood to these organs. But it is in the first division we find our agents which are the best diuretics in heart failure, and what position scoparium should hold it is difficult to say from want of observation and experiments, but it will probably be found among the first named. The other class of diuretics, as colchicum, cantharadine, and buchu, etc., which increase the amount of solids without affecting the bulk of urine, are not to be regarded as diuretics in the treatment of heart failure.[1] Stimulants are diuretics insomuch as they increase the completeness of the ventricular contractions and improve arterial tension.

Diaphoretics are not yet sufficiently adopted as a means of affording relief in dropsy and the sequelæ of heart failure; but it is not only a very effectual, but, in my experience so far, a perfectly safe way of increasing water elimination, especially when the heart failure is accompanied by renal disease. The sitz-bath is a good form, or any bath which permits the patient to breathe freely: Turkish baths are regarded as not very safe. Another plan, employed by the late Sir James Simpson, has been so useful that it cannot be omitted, and that is, to fill six or eight lemonade bottles with boiling water, cork them well, and draw over each a woollen stocking wrung out of hot water, then pack them round the patient in bed, who in fifteen minutes or so commences to sweat profusely: they can be continued for an hour, or repeated when necessary. This plan can be resorted to with the poorest patients, and when a patient of any class is confined to bed. In obstinate cases, where the skin will not be induced to relax by hot baths, cold packing has been resorted to in order to paralyze the minute vessels of the skin, and thus produce dilatation of them in cases of chronic kidney disease; but I am not acquainted with the details as to whether cases with distinct heart failure were so treated or not.

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[1] The Americans seem better acquainted than we are with the difference betwixt water diuretics and solid diuretics; and this is due to the adoption of the conclusions of Hammond in his essay "On the Action of Certain Vegetable Diuretics, 1859."

Dropsy is not only a great cause of suffering to a patient with heart disease, but is regarded by non-professional people as indicating great danger to existence. It is, no doubt, a sign of failing power of serious import; still its occurrence often gives temporary relief. When the distended venous system is relieved by a sudden general œdema, great and immediate relief is experienced, and that may be utilized to improve matters and to induce re-absorption. But usually dropsy commences insidiously, retreats for a longer or shorter time under proper treatment, but usually it is not long in returning, and is more persistent on each reappearance. If, during the interval, the patient has been under good treatment, and yet in spite of it it returns, it is a prognostic sign of the very worst import: no worse sign can exist, and its reappearance calls for the most energetic treatment. Sometimes œdema is very capricious in its seat, and flits about in a curious to-and-fro manner; in one well-remembered case, where the lesion was tricuspid, the oscillations from legs to lungs and back again were very marked. If the patient was found with a less agonized countenance, his legs were tremendously swollen; when he was gasping for breath, his legs were fallen. Dropsy, as a sequel to heart disease, is amenable, more or less, to the measures cited above, in addition to which is the question of puncture. Nature oftentimes establishes a drain of her own; not always with good effect. Puncture, or incision, is, in my personal experience, in most cases worse than useless, and only adds a wet bed to the patient's sufferings. One case only can I recall where the benefit was decided and unequivocal. Others have had a less unpleasant experience, but it is in dropsy from heart and kidney disease combined that the benefit of puncture or incision is chiefly seen. In simple heart failure it is a hazardous proceeding, and sometimes the carbonic-acid poisoning, the irregularity of pulse, dyspnœa, etc., commence to increase on the establishment of the drain. In one case this occurred when the serum spirted out of the needle-holes in an arterial jet, and the bed was soon in a perfect puddle, and could not be kept otherwise during the six-and-thirty hours the patient survived. Still the puncture, or incision, is among our armamentaria, and does frequently afford more or less relief; but the incisions may become troublesome sores, or even slough.

Another troublesome sequel of heart failure is increased flow of bronchial mucus or serum, a chronic bronchitis or bronchorrhœa.[1] This is not only a result of imperfect nutrition to the respiratory structures and consequent formation of many imperfect epithelium cells or mucus, but is also a consequence of pulmonic congestion, and as such gives more or less relief to the distended vessels. It is thus often useful though troublesome, for it disturbs the patient's rest and impedes his respiration. Where this condition is marked, a mixture of digitalis, or belladonna with senega or squill and æther may be prescribed; the two forms given here are useful, one very palatable and the other very effective.

℞ Tinct. belladonnæ, ♏xv.
Sp. chloroform, ♏xxv.
Ac. mur. dil. ♏x.
Syr. scillæ, ʒ1.
Aquæ ad ℥1, ter in die.

℞ Tinct. digital. ♏x.
Ammon. carb. gr. v.
Inf. senegæ, ℥1, ter in die.

One caution must be observed in the paroxysms of chronic bronchitis in heart failure as regards prognosis. Again and again will such a patient alarm all around him, and even induce his physician to regard dissolution as impending, and in the morning—for it is usually in the evening or early night they come on—fall into a doze, wake up relieved, and go on fairly for some time after. This is, though a fortunate termination, sometimes unfortunate for the physician, in this way:—The alarmed friends sit up all night, and next day—the alarm having passed away—are apt to regard the physician who, however naturally, led them into error, as wanting in knowledge of his profession. This acute pulmonic congestion, with free flow of serum, must not then be regarded as an accession of acute bronchitis, which would, in all human probability, be fatal, but be described as a period of suffering and peril, from which it is not impossible the patient may emerge. So also may this condition of pulmonic congestion lead to rupture of the vessels and hæmoptysis. This is often very alarming; but this hæmoptysis is not itself injurious, except by the loss of blood; and probably in so severe congestion the loss of blood is necessary, and could not be so cheaply or effectually furnished in any other manner. Blood is blood, and whether it is lost by bleeding, leeches, or hæmoptysis, it is the same. Hæmoptysis is the most direct form of unloading the overcharged vessels, and is not specially injurious, though of course it may go on to a fatal termination, especially when fed by stimulants.

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[1] Rindfleisch, "Lehrbuch der Pathologischen Gewebelehre," 1869, § 461. Bronchialkatarrh. Krankheiten der Lunge in Folge von Anomalien des Herzens, "bei meisten Individuen welchen an Insufficienz und Stenose der Mitralklappen leiden, in einer Andauernden statischen Hyperämie der Bronchialschleimhaut eine starke Disposition zu katarrhalisher Entzündung gegeben ist."

But ordinarily considered, hæmoptysis in heart disease is not itself a disease or dangerous, but it is a symptom of a very serious condition; and it is that condition on which it depends, and not the hæmoptysis itself, which should excite our fears. It is better, too, not to attempt to arrest the flow here by sulphuric acid, opium, and acetate of lead, etc., which certainly disturb the stomach, but to keep the patient perfectly quiet. Should the friends be very much alarmed, it may be desirable to resort to general bleeding.

So, too, when the powers are failing, and the patient, utterly worn out, is sleepy to a degree, dozing off for a moment, and then waking up with a start in terror, and gasping for breath—even in this piteous condition to administer soporifics is a moral crime. If the patient sleeps, it is that sleep which knows no wakening, except in another state of being. The late Hyde Salter pointed this out strongly. "Take away," he says, "the necessity for the voluntary effort indispensable to respiration, and the patient would soon be so sound asleep it would be difficult to wake him. Suspend the voluntary efforts by an opiate, and the sleep is the sleep of death." However much we may pity the sufferer, we cannot feel justified in prescribing opium or other narcotic for a condition which is not sleeplessness, but where voluntary effort, incompatible with sleep, is necessary to existence. Nor is chloral hydrate any safer here than the vegetable soporifics. A friend, whom I will not name, one day ordered chloral to a patient in this condition, and on being asked if it was effective, said—"Highly so! the patient never wakened, and has been buried three weeks."

The question of stimulants in the treatment of heart disease and its sequelæ is a difficult one. Where they are habitually taken, it may neither be desirable nor easy to withdraw them; but where they, *i.e.*, alcoholic stimulants, evidently increase the rapidity and impair the quality of the ventricular contractions, some attempt must be made to diminish, at least, the amount. Where a dose of alcohol improves the pulse and enables the patient to eat and digest better, its use is indicated. In the most advanced stages, alcohol is simply indispensable, and forms the chief portion of what the patient takes. In the less advanced stages, it is often desirable that the patient take spirit and water before getting into bed; it warms him in the cold bed, and helps him off into refreshing sleep with less evil effect than any other agent. The cold of the bed often has a disturbing effect on these patients. The blood in the skin, chilled by contact with the cold clothes, excites spasm of the pulmonary arterioles by its temperature, and thus taxes the right heart. The bed should be previously warmed.

External measures are, to some extent, useful—as a belladonna plaster over the region of the heart, for instance, which is a favourite measure with many. It is, to some extent, physically useful; but psychically it often acts charmingly, and so may often be recommended with advantage. As to blisters over the region of the heart to allay irritability, no modern-educated person would think of resorting to them; as good or better effects having been produced in the hands of those who do not resort to them as with those who do, the effect of them may be regarded as adding a troublesome sore to the patient's troubles, and so diverting their attention.

The general treatment, in the more advanced cases, consists of food nutritious and easily assimilable, in small quantities, and often. Very little or no supper is desirable; and patients soon find out that they must make their choice betwixt suppers and dyspnœa, or the absence of both—the relation between the two is unequivocal.[1] The morning is the time during which the bulk of the food must be taken. The clothing must be warm, for the tendency to lowering of temperature is marked. Exercise must be limited, and exertion forbidden. The bowels must be regulated, and no straining at stool must be permitted. Death on the night-chair is not at all uncommon in heart disease. The venous congestion leads to gastric catarrh, with its pathognomonic symptom of sense of fulness constantly, and to constipation, and attention must always be directed to the condition of the intestinal canal. The bladder must be examined occasionally, and if involuntary dribbling exists a catheter must be used; for, as Sir Henry Thompson insists, involuntary micturition is the evidence of a distended bladder and not of an empty one. This attention to the bladder is more necessary, as prostatic enlargement is common in elderly men, who are also often the subject of heart disease. But there is another reason, and that is, that, in consequence of the venous congestion of the brain, the patient becomes altered in his cerebral manifestations, and not unfrequently his habits change somewhat. This effect of congestion of the cerebrum and its mental consequences are more frequent than is generally thought. The patient has a tendency to become petulant, whimsical, and childish, and must be treated with great considerateness. The appetite is often capricious, and must be humoured as far as is safe. The whole management of the sufferer from heart disease of an advanced type is especial, and consists of a union of judicious firmness, perfect openness, and infinite patience. The patient must be made as clearly aware of the nature of his case as is possible; and in those cases where the patient positively declines to know anything about himself, the friends should have the case explained to them, for his guidance, as to what he must do and what he must avoid, and why and wherefore. For, if the case is a prolonged one, everything to facilitate a good understanding and perfect mutual confidence must be cultivated; for this mutual confidence will many a time and oft be strained, partly by the oscillations of hope and despair in the patient, but more frequently from the interference of others.

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[1] There is no doubt that in the reclining posture the diaphragm is pressed on by the food in the stomach, and infringes on the space within which the heart moves.

Intercurrent disease of every kind, and especially bronchitis, which taxes the heart dreadfully, is attended with more than ordinary danger, and special attention must be paid to the heart, and measures taken to sustain it, or the patient will surely die. Finally, every case is a subtle problem to be solved; whether it is in that stage that recovery or repair is possible, or in that more advanced condition where treatment can only be regarded as a means of procuring more perfect euthanasia. When, however, the tricuspid becomes obviously affected, whether early on in the case or after a long period, the case passes quickly into the last category. Here no means of acting on the heart itself can do much, and that little only so long as the veins will or can sustain the pressure thus increased. Relief of the venous congestion, by acting on the various emunctories, is all that we can fairly hope for here; and whatever measures be adopted, it is not for long. Whatever hopes of prolonged life had previously existed must be given up, when the tricuspid lesion becomes marked; and from the last division of treatment alone can anything almost be expected.

ARTICLE III.—*On the Relative Weight of the Brain in the Sane and Insane.* By WILLIAM G. BALFOUR, L.R.C.S.E., Assistant Medical Officer, Montrose Royal Asylum.

IN the *Edinburgh Medical Journal* for April 1843 and September 1846, Drs Reid and Peacock published a series of observations on the weight of the brain in the sane; in 1854 Dr Skae, in an appendix to his annual report, gives tables showing the weight of the brain in 199 persons who died insane in the Edinburgh Asylum—98 of the weighings being of male and 101 being of female brains; but by far the most elaborate paper on the subject is that by Dr Thurnam, in the *Journal of Mental Science* for April 1866. Dr Thurnam has, in the paper written by him, collected all the information which up to that time had been published on the weight of the brain in the sane and insane. The following observations and tables are, by permission of Dr Howden, constructed from the weighings of the brain of 200 persons who died insane in the Montrose Asylum, and include, in some instances, the tables of Drs Reid, Peacock, Skae, and Thurnam.

Of the 200 brains weighed in the Montrose Asylum, 100 are men and 100 women. Many of them have been made under my own observation, and I believe them to be as far as possible accurate. In all of them the ventricles were opened, the cerebellum separated from the cerebrum, and the brain sliced previous to its being weighed, so that most of the serous effusion was allowed to drain away. The encephalon was first weighed, then the cerebellum, pons, and medulla, and the weight of the cerebrum calculated as the difference between them. The weights used are avoirdupois. When mention is made of the cerebellum, it is to be understood as including the pons varolii and medulla oblongata.

Different averages have been given by different observers as the weight of the sane brain—it having been variously stated as 47 oz. 8 dr., 49 oz., 49 oz. 14 dr., 50 oz. 3½ dr., for males; and 43 oz. 1 dr., 44 oz. 5 dr., 44 oz. 8½ dr., for females. In the last edition of Quain's "Anatomy" the average weight of the male encephalon is stated as being 50 oz. 3½ dr., and that of the female as 44 oz. 8½ dr. This is the average that is used in the following tables.

In Table I. the average weight of the sane encephalon is shown, and also the weight of the encephalon in the insane, as observed in the asylums at Somerset, Wilts, York, Edinburgh, and Montrose. The difference between the weight of the male and female brain in both classes is also stated.

TABLE I.—*Average Brain-Weights of Sane and Insane compared, and difference between Males and Females.*

	MALES.		FEMALES.		*Difference.*	
	oz.	dr.	oz.	dr.	oz.	dr.
Encephalon.—Sane, ...	50	3½	44	8½	5	11
" Insane—Somerset, .	46	6	43	2	3	4
" " Wilts, . .	46	3	41	1	5	2
" " York, . .	48	7	43	1	5	6
" " Edinburgh,	50	2	44	0	6	2
" " Montrose, .	48	4	43	8	4	12

The averages given have been calculated from all ages, but necessarily contain but few weighings previous to the twentieth year, as the number of people who die in asylums before they have reached the twentieth year is small. From a subsequent table it will, however, be seen that the general averages are but little affected by the weights in the very young and the very old as far as the insane are concerned. On examining Table I. it will be noticed that the averages amongst the males from Somerset and Wilts Asylums approach one another very closely; those from York and Montrose Asylums are also almost the same; and those from Edinburgh are only 1 dr. less than the sane. The female averages are closest to one another, as follow:—The sane and those from the Edinburgh Asylum, the insane from Somerset and York Asylums, and the insane from Wilts and Montrose Asylums. The high average furnished by the males of the Edinburgh Asylum may possibly be accounted for by the fact that the general average has been calculated from the averages in the decennial periods instead of from the whole weighings; and when the table published by Dr Skae is examined, it will be seen that the average given for the decennial period between 70 and 80 is 57 oz. 8 dr., an average exceeding by 7 oz. the highest average in the other periods. It will also be noticed that only one brain was weighed by Dr Skae in the decennial period between 70 and 80 years. If this high average is excluded from Dr Skae's table, and that for the same period in the Montrose Asylum substituted, the general average for males who have died in the Edinburgh Asylum will be 48 oz. 11 dr., instead of 50 oz. 2 dr., and it will thus be nearly the same as the averages from York and Montrose Asylums. The smallness of the averages from Wilts and Somerset as contrasted with those from York, Edinburgh and Montrose Asylums, I am unable to account for, having no means of examining the data on which they are founded.

From Table I. the following conclusions are drawn :—

1*st*, That, as among the sane so amongst the insane, the brain of the male is heavier than that of the female.

2*d*, That the brains of the sane are, in both the sexes, heavier than the brains of the insane.

In Table II. the ratio that the female brain-weight bears to the male when taken as 100, is given for the sane and insane.

TABLE II.—*Ratio that the Female Brain-Weight has to the Male in the Sane and Insane.*

	FEMALES.	MALES.
Sane, ...	88	100
Insane—Somerset, . .	92	100
,, Wilts, . . .	88	100
,, York, . . .	88	100
,, Edinburgh, .	87	100
,, Montrose, . .	90	100

Average ratio from the insane female in all the asylums, as compared with the male—89·4 to 100.

In Table III. the ratio that the weights of insane brains have to sane, is given for both the sexes; 100 being taken to represent the sane in both sexes.

TABLE III.—*Ratio of the Brain-Weight of the Insane to the Sane in both Sexes.*

	MALES.		FEMALES.	
	Insane.	Sane.	Insane.	Sane.
Somerset, ...	92·1	100	96·8	100
Wilts, ...	91·97	100	92·2	100
York, ...	96·45	100	96·7	100
Edinburgh, ...	96·9	100	98·8	100
Montrose, ...	96·0	100	97·6	100
Averages of the Insane from all the Asylums,	94·6	100	96·3	100

The average weight of the male brain is reckoned as being 10 per cent. greater than that of the female amongst the sane, this difference being accounted for by the smaller stature of the female by some; by others the female is considered to be of less physical and intellectual powers than the male; the former reason appearing to have more truth than the latter. The same ratio is observed amongst the insane, and nearly in a like proportion.

Table III. shows that when the average weight of the brain of persons dying insane is compared with that of persons dying sane, there is a distinct diminution in that of the insane. This agrees with the observations of Dr Thurnam, but is opposed to a statement of Dr Skae's, who, from his observations, concludes that "the average weight of the encephalon is increased in persons dying insane."

It is possible that Dr Skae may have come to the above conclusion from his having calculated his general average in the manner previously stated, and also from his having started with a low average for the weight of the sane encephalon; for, when the corrections for these two errors are made, there is found to be only 1 per cent. of difference between the weights of the brains of the insane—whether dying in York, Edinburgh, or Montrose Asylums. Dr Thurnam, in trying to explain the anomaly of the increased weight of the insane male brains in the Edinburgh Asylum, considers that more of them are from a higher and better educated class than the insane in the other asylums.

In the next table the average weight of the male cerebrum and cerebellum in the sane and insane is given, along with the increase, in favour of the sane.

TABLE IV.—*Average Weight of the Cerebrum and Cerebellum in the Sane and Insane, with the difference between them.*

	MALES.		*Difference.*		
	Cerebrum. oz.	Cerebellum. oz.	Cerebrum. oz.	Cerebellum. oz.	
Sane, ...	43·98	6·23			
Insane—Somerset, .	40·21	6·39	3·77	·16	of insane over sane.
„ Wilts, . .	39·55	6·75	4·43	·52	„
„ Edinburgh, .	42·50	6·18	1·48	·5	of sane over insane.
„ Montrose, .	42·1	6·15	1·88	·8	„
Average of all the Insane, . .	41·9	6·36	2·08	·13	of insane over sane.

Table IV. shows an increase in the weight of the sane cerebrum in the male sex over the insane of 2·08 oz., and an increase in the weight of the cerebellum of the insane over that of the sane of 13 oz., resulting in the greater weight it seems to have in the English weighings, as the Scotch show rather below the average.

Table V. shows the average weight of the cerebrum and cerebellum in the female, including both sane and insane, with the difference between them.

TABLE V.—*Average Weight of the Cerebrum and Cerebellum in the Sane and Insane, with the difference between the Sane and Insane.*

	FEMALES.		*Difference.*	
	Cerebrum.	Cerebellum.	Cerebrum.	Cerebellum.
	oz.	oz.	oz.	oz.
Sane, ...	38·75	5·8		
Insane.—Edinburgh, .	38·31	5·33	·44	·47
„ Montrose, .	38·13	5·37	·62	·43
Average of Insane, .	38·22	5·35	·53	·45

From the preceding table it will be seen that the difference of weight between the cerebrum and cerebellum of sane females and that of insane females is 0·53 for the cerebrum and 0·45 for the cerebellum. When the insane from Edinburgh and Montrose Asylums are classed together this will only bear the one conclusion, that there is but little decrease of weight in the cerebrum and cerebellum amongst insane females generally from the average standard in the sane, although when the insane are taken from individual asylums the difference is more striking.

The proportion that the cerebellum bears to the cerebrum in the sane and insane is as follows :—

	MALES.			FEMALES.		
	Cerebellum.		Cerebrum.	Cerebellum.		Cerebrum.
Sane, . . .	1	to	7	1	to	6·7
Insane, . . .	1	to	6·6	1	to	6·4

It appears thus that the difference of average weight between the sane and insane in both sexes, when calculated from all ages, is dependent upon an increase in the average weight of the cerebrum, and that the weight of the cerebellum is little affected by insanity.

The extreme weights of the human brain for the sane, as observed by Dr Peacock, and also those for the insane who have died in the Montrose Asylum, are given in the next table :—

SANE.				INSANE.			
Heaviest.		*Lightest.*		*Heaviest.*		*Lightest.*	
Males.	Females.	Males.	Females.	Males.	Females.	Males.	Females.
oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.
62 12	54 0	34 0	36 12	60 0	53 12	34 0	31 0
Above mean.		Below mean.		Above mean.		Below mean.	
12 8	9 7½	16 3½	7 12½	9 12½	9 3½	16 3½	13 8½

The question of the increase in the weight of the brain in proportion to the intellectual power seems difficult to settle.[1] It is true that the brains of such men as Cuvier, Spurzheim, Chalmers, Abercrombie, and Goodsir, have as much exceeded the average weight of the human brain as their intellectual power exceeded the average; but, excluding such men as the above named, it must be concluded that, as far as has yet been proven, no definite statement can be made as to the relation that the brain-weight has to the intelligence. Subjoined are the cases of the persons who have died in the Montrose Asylum possessing the extreme brain-weights, and in a tabular form is given the weights of all their organs, together with the average weight of the organs in the sane.

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[1] Two males have died in the asylum recently, the one an imbecile, æt. 75, and the other an epileptic idiot, æt. 18. The brain of the imbecile weighed 63 oz. 4 dr., and that of the idiot 48 oz. The brain-substance in both was apparently normal.

CASE 1. (Male, brain weighing 60 oz.)—W. B., æt. 69, a shoemaker, of ordinary education and regular habits, became very much depressed on the death of his wife, the depression being followed by a maniacal attack, for the treatment of which he was sent to the asylum. Seven years after admission into the asylum he became partially demented, and died of suffocation from choking. At the post-mortem the brain-substance was noticed to be dense, otherwise apparently normal.

CASE 2. (Female, brain weighing 53 oz. 12 dr.)—Mrs C., æt. 43, a married woman, formerly a domestic servant, was admitted into the asylum labouring under mania. She died four months after admission of heart disease. At the post-mortem considerable venous congestion of the brain was observed, otherwise it was apparently normal.

TABLE VI.—*Weight of the different Organs in the Cases of the Male and Female who died in the Montrose Asylum possessing the Heaviest Brain-Weights, and contrasted with the Averages for the Sane.*

	MALES.				FEMALES.			
	Insane.		Sane Average.		Insane.		Sane Average.	
	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.
Encephalon, .	60	0	50	3½	53	12	44	8½
Cerebrum, .	52	8	43	15¾	48	0	38	12
Cerebellum, .	7	8	6	6¾	5	12	5	12
Heart, . .	13	8	11	0	19	8	9	0
Right Lung, .	25	8	24	0	24	0	17	0
Left Lung, .	24	0	21	0	31	8	15	0
Liver, . .	45	0	48 to 58	0	69	12	40 to 50	0
Spleen, . .	5	0	5	7	8	12	4	6
Right Kidney, .	4	4	5	8	5	8	4	12
Left Kidney, .	4	8			5	8		

CASE 3. (Male, brain weighing 34 oz.)—A. M., æt. 43, a carpenter, who laboured under general paralysis. He is stated to have had a hereditary tendency to insanity. He had hallucinations of sight. Fifteen months after admission, he was demented, ground his teeth, and could not articulate or walk correctly. It was observed that in bed he always lay with his head flexed forward and not resting on the pillow; during all the time he was in the asylum he was never found asleep. He died twenty months after admission of a congestive attack. At the post-mortem upwards of ℥viii. of fluid was

collected from the arachnoid sac; the membranes were adherent to the cortical substance; the ventricles were much distended with fluid; and their floors covered with granulations.

CASE 4. (Female, brain weighing 31 oz.)—M. F., æt. 72, laboured under senile dementia. She died of old age. At the post-mortem the brain-substance was found to be extremely œdematous, and the arachnoid contained a large quantity of fluid, as did also the ventricles.

TABLE VII.—*Weight of the different Organs in the Cases of the Male and Female who died in the Montrose Asylum possessing the Lightest Brain-Weights, and contrasted with the Average for the Sane.*

	MALES.				FEMALES.			
	Insane.		Sane Average.		Insane.		Sane Average.	
	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.
Encephalon, .	34	0	50	3½	31	0	44	8½
Cerebrum, .	27	8	43	15¾	25	8	38	12
Cerebellum, .	6	8	6	3¾	5	8	5	12½
Heart, . .	11	12	11	0	8	0	9	0
Right Lung, .	28	12	24	0	12	0	17	0
Left Lung, .	24	12	21	0	7	0	15	0
Liver, . .	46	4	48 to 58	0	27	8	40 to 50	0
Spleen, . .	6	12	5 to 7	0	4	0	4 to 6	0
Right Kidney, .	5	8	5	8	2	0	4	12
Left Kidney, .	4	12			2	0		
Height, . .	5 ft. 7 in.		5 ft. 6½ in.		5 ft.		5 ft. 2 in.	

In the instances of the heaviest male and female brains, neither their cases nor the autopsy reveal anything to account for their great weight; but, in the instances of the lightest brains, the cases show dementia previous to death, and the autopsy shows in both the male and female very large effusions of serum into the arachnoid sac and ventricles, and in them water seems to take the place of brain-substance. The age at which the brain is considered to reach its maximum weight is variously stated by different writers, both as regards it, when taken as a whole, and also in its individual parts. Generally speaking, the period when man is in his highest state of development may be reckoned as between the twenty-fifth and fifty-fifth years, and it is consequently to be inferred that, during that time, the brain would have its greatest average weight. The following table gives the averages of the brain-weight in the period above mentioned, both amongst the sane and insane.

TABLE VIII.—*Average Weight of the Encephalon in the two Sexes between Years* 25 *and* 55.

	SANE.					
	Males.		Females.		Difference.	
	oz.	dr.	oz.	dr.	oz.	dr.
Encephalon, .	50	3½	44	8½	5	11
Cerebrum, .	43	15¾	38	12	5	3¾
Cerebellum, .	6	3¾	5	12½	0	7¼

INSANE.

	Males.		Females.		Difference.	
	oz.	dr.	oz.	dr.	oz.	dr.
Encephalon, .	48	4	44	6	3	14
Cerebrum, .	42	3	38	12	3	7
Cerebellum, .	6	5	5	10	0	11

In this table the sane are taken from a table by Dr Reid, in his "Physiological, Anatomical, and Pathological Researches." It will be seen from this table that there is no change in the general average of the insane male encephalon whether it be calculated from all ages or only in the period from 25 to 55, whilst in the insane female the encephalon is brought nearer that of the sane when calculated from the weighings between 25 and 55. Dr Thurnam considers that the sane encephalon has its highest weight in males in the decennial period from 30 to 40, and in females previous to the 30th year.

TABLE IX.—*Average Weights of Sane and Insane in Decennial Periods.*

Decennial Periods.	Encephalon.								Cerebrum.								Cerebellum.							
	Males.				Females.				Males.				Females.				Males.				Females.			
	Sane.		Insane.		Sane.		Insane.		Sane.		Insane.		Sane.		Insane.		Sane.		Insane.		Sane.		Insane.	
	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	dr.	oz.	d
To 30 yrs.	47	12	47	9	42	$0\frac{1}{4}$	46	6	41	11	41	8	36	$12\frac{1}{6}$	40	7	5	13	6	0	5	$1\frac{1}{2}$	5	1
30 to 40 "	51	$0\frac{25}{41}$	49	9	45	$3\frac{3}{23}$	43	3	45	$1\frac{6}{7}$	43	$0\frac{1}{16}$	39	$1\frac{13}{25}$	37	8	6	$5\frac{25}{28}$	6	2	5	$9\frac{11}{25}$	5	1
40 to 50 "	49	$3\frac{37}{44}$	46	13	45	$2\frac{12}{13}$	45	3	43	$5\frac{6}{32}$	40	6	40	$0\frac{1}{3}$	39	10	6	$4\frac{31}{32}$	6	4	5	$15\frac{2}{9}$	5	
50 to 60 "	49	$10\frac{1}{2}$	47	4	44	13	44	9	33	$11\frac{15}{16}$	40	14	38	0	38	14	6	$2\frac{9}{14}$	6	10	5	$4\frac{1}{2}$	5	1
60 to 70 "	48	8	49	12	43	$3\frac{5}{14}$	43	11	43	$8\frac{2}{5}$	43	8	37	$10\frac{5}{14}$	37	15	5	13	6	4	5	9	5	1
70 and upw.	48	$1\frac{3}{5}$	46	6	42	11	40	3	42	$3\frac{3}{5}$	40	4	37	0	34	10	5	$13\frac{3}{5}$	6	0	5	8	5	1

In Table IX. the insane are seen to correspond very nearly with the statement made by Dr Thurnam regarding the sane; for, although the highest average given for the insane in the decennial periods is between the years 60 and 70 in the males, still that between 30 and 40 is almost equally high, being for the first 49 oz. 12 dr., and for the second 49 oz. 8 dr.; and there may have been some cause for the increase between 60 and 70 amongst the insane that I have failed to discover. In Table IX. the weights of the sane are taken from a table by Dr Peacock; and Tables X. and XI. are constructed from tables given by Dr Skae in his appendix to his report previously mentioned, along with the weighings from the Montrose Asylum. These tables include the numbers weighed, the heaviest and lightest, with the averages in the decennial periods for both sane and insane. On the left of the sane column are the weighings from the Montrose, and on the right those from the Edinburgh Asylum.

TABLE X.—*Comparative Weights of Brains in Sane and Insane.*

MALES.

Age.	Numbers Weighed.									Heaviest.								
	Encephalon.			Cerebrum.			Cerebellum.			Encephalon.			Cerebrum.			Cerebellum.		
	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.
										oz. dr.	oz.dr.	oz.dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	o. d.	o. d.
To 30, .	7	48	19	7	32	19	7	33	19	51 0	61 2	57 12	45 0	54 0	52 0	7 4	7 2	7 8
30 to 40, .	30	41	26	30	28	26	30	28	26	58 4	62 8	56 0	51 4	54 8	49 8	8 0	7 8	7 12
40 to 50, .	11	44	25	11	32	25	11	32	25	53 8	62 12	58 0	48 0	49 0	50 8	7 8	7 10	8 0
50 to 60, .	21	32	18	21	28	18	21	29	18	53 0	55 15	58 8	46 12	48 14	52 0	7 8	7 9	7 10
60 to 70, .	20	18	8	20	10	7	20	12	7	60 0	60 4	52 8	52 8	51 13	45 8	7 8	7 4	7 8
70 and upwards, .	11	8	2	11	8	2	11	8	2	54 4	53 5	52 12	43 12	46 16	46 6	7 0	6 8	6 6
Total & Aver.	100	191	98	100	138	97	100	142	97	54 5	59 5	55 14	47 14	50 13	49 5	7 10	7 6	7 7

	Lightest.									Average.								
	Encephalon.			Cerebrum.			Cerebellum.			Encephalon.			Cerebrum.			Cerebellum.		
	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.
	oz.dr.	oz. dr.	oz.dr	oz.dr.	oz.dr.	o. d.	o. d.	o. d.	o. d.	o. d.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.
Ages as above.	38 0	38 0	39 0	37 0	34 0	33 8	4 12	5 4	5 4	47 9	50 14	49 10	41 8	43 3	43 3	6 0	6 4	6 7
	40 8	40 8	44 0	32 8	35 9	37 8	5 4	5 1	6 0	49 9	51 1	50 1	43 1	45 2	43 6	6 12	6 6	6 11
	30 4	34 0	41 12	27 8	37 13	36 0	5 8	5 6	5 0	46 13	49 4	49 4	40 6	43 5	42 8	6 4	6 5	6 12
	39 0	40 9	41 2	32 0	37 11	39 14	4 12	5 3	5 14	47 4	49 10½	49 12½	40 14	43 12	43 6	6 10	6 2½	6 6½
	40 0	40 0	44 0	35 12	34 8	38 10	5 0	4 15	5 12	49 13	48 4	48 2	43 8	43 8	41 11	6 4	5 13	6 7
	40 12	42 2	52 12	35 8	39 8	46 6	5 8	5 9	6 6	46 6	48 15½	52 12	40 4	42 15	46 6	6 0	6 0½	6 6
Aver.	39 3	39 3	43 12	33 6	36 8	38 10	5 2	5 3	5 12	47 14	49 11	49 14½	41 9½	43 10	43 6	6 5	6 2	6 8

TABLE XI.—*Comparative Weights of Sane and Insane Brains.*

FEMALES.

Age.	Numbers Weighed.									Heaviest.								
	Encephalon.			Cerebrum.			Cerebellum.			Encephalon.			Cerebrum.			Cerebellum.		
	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.
										oz. dr.	o. d.	o. d.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	o. d.	o. d.
To 30, .	6	40	15	6	31	15	6	31	15	52 0	50 0	53 0	45 4	43 14	45 8	7 0	6 8	8 0
30 to 40, .	18	33	29	18	25	29	18	25	29	48 0	54 0	61 8	42 12	45 2	54 8	6 8	6 8	7 8
40 to 50, .	14	23	24	14	18	24	14	18	24	53 12	53 0	53 0	48 0	47 0	47 0	6 8	7 0	6 8
50 to 60, .	29	7	20	29	6	20	29	6	20	51 8	46 3	53 8	45 8	40 13	47 8	6 4	5 9	6 8
60 to 70, .	21	14	13	21	14	13	21	14	13	52 8	48 12	50 0	47 0	41 2	44 0	7 0	6 0	7 0
Total & Aver.	88	117	101	88	94	101	88	94	101	51 9	50 6	54 3	45 11	43 9	47 11	6 10	6 5	7 1

	Lightest.									Average.								
	Encephalon.			Cerebrum.			Cerebellum.			Encephalon.			Cerebrum.			Cerebellum.		
	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.	Insane.	Sane.	Insane.
	o. d.	oz. dr.	o. d.	o. d.	o. d.	o. d.	o. d.	o. d.	o. d.	o. d.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr.	oz. dr
Ages as above.	41 4	39 0	37 12	35 12	35 8	31 12	5 8	4 12	4 8	46 6	43 15	43 0	40 7	38 6	36 10	5 15	5 8	5 9
	34 8	38 0	39 8	28 8	32 12	33 8	3 0	4 4	5 0	43 3	45 3	46 0	37 8	39 1	40 0	5 11	5 9	6 0
	36 4	36 12	37 0	31 0	32 8	31 4	4 12	4 4	4 12	45 3	45 3	44 9	39 10	40 0	38 11	5 9	5 15	5 14
	37 8	43 9	39 8	32 8	38 1	34 0	5 0	4 15	5 0	44 9	44 13	46 1	38 14	38 0	40 2	5 11	5 4	5 14
	37 4	36 2	34 12	32 0	31 2	30 0	4 12	5 0	4 12	43 11	43 3	44 5	37 5	37 10	38 6	5 12	5 9	5 15
Aver.	37 5	38 11	37 11	31 15	33 15	32 1	4 9	4 10	4 12	44 9	44 7	44 12	38 12	38 9	38 12	5 11	5 9	5 13

Although the preceding observations are made from a series of weighings much too scanty to permit of any absolute conclusion, they seem to support the view that insane brains differ from sane as regards weight in being slightly lighter; that this is dependent on a decrease in the weight of the cerebrum—there being no loss of weight in the cerebellum; and that the cases of chronic insanity and dementia in which serous effusions and œdema of the brain-substance are so often met with, furnish a probable cause for the decrease. There seems no reason to suppose that in cases of recent insanity any difference between the weights of sane and insane brains is to be detected.

ARTICLE IV.—*Colonial Lunacy Boards; with special reference to New Zealand.* By W. LAUDER LINDSAY, M.D., F.R.S.E., Physician to the Murray Royal Institution (for the Insane), Perth.

I SPENT four or five months at the close of 1861 and beginning of 1862 travelling through, or residing in, the New Zealand provinces—remaining about three months in Otago and one in Auckland, but paying visits of only one, two, or three days in Nelson, Wellington, and Taranaki. I gave special attention wherever I went to the subject of *Insanity and its treatment.* In Dunedin, Nelson, and Auckland I visited the various public receptacles for the custody of the Insane under the auspices of the Government or civic authorities, who placed at my disposal all printed documents necessary for my full information concerning their present and past condition. I would here acknowledge the facilities that were offered to me by these various authorities—medical or legal, official or private. More especially have I to record my obligations to certain public officials,[1] who have taken the trouble, since my return home, regularly to forward various Government reports or papers, as well as newspapers, containing information bearing on the local lunatic asylums, or on the condition of the local insane, and records of the progress or reform in opinion and practice in the lunacy affairs of the colony.

I had originally intended, as soon as possible after return home in 1862, to embody the results of my whole inquiry—*On the present State of Insanity and its Treatment in New Zealand, with the suggestions therefrom arising*—in a full Report on the subject. But many circumstances have conspired to prevent my doing more *as yet* than to draw attention to two of the subjects that seemed to me of the highest and most immediate importance to the New Zealand Government in relation to future legislative provision for the proper treatment of the rapidly-increasing number of its insane, viz.:—

(1.) The desirability of, if not the necessity for, the appointment of a *Central (or General Government) Board of Lunacy* competent to advise colonial legislators on all matters connected with insanity and its treatment, including, for instance, the construction of new laws, and the erection and regulation of proper public lunatic asylums.[2]

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[1] (1.) The Hon. Wm. Gisborne, Colonial Secretary, and John B. Bennett, Esq., Registrar-General, of the Colony, for the Annual "Statistics" of New Zealand—a valuable Government blue-book.

(2.) John Hislop, Esq., Secretary of the Education Board of Otago, for numerous Provincial or General Government papers, as well as for local (Dunedin) newspapers.

[2] "Suggestions for the proper Supervision of the Insane and of Lunatic Asylums in the British Colonies."—Brit. and Foreign Medico-Chirurgical Review for October 1869, p. 480.

Certain arguments for the establishment of Colonial Lunacy Boards are also

(2.) The propriety of devising effectual means of preventing the present wholesale transhipment from Great Britain and Ireland to New Zealand of certain classes of the insane.[1]

I am induced now to offer a further contribution of *suggestions* concerning the legislative provisions, which it is desirable to make for the treatment of the insane in New Zealand, by the consideration that the Colonial Government has just given signs of a disposition or readiness to do something in the direction of progress or reform in local lunacy matters. Inasmuch as my opinion was repeatedly invited or *requested*, alike by public authorities and private individuals interested in the condition of the insane, in New Zealand, and has since my return home been *expected;* and in so far, moreover, as it is only *due* to those who favoured me with materials for the formation of an opinion with the specific object in view that I should not only form one but give public expression thereto, I offer the following suggestions in the hope that they may yet be in time to aid in the formation of proper public opinion, or of directing into a proper channel certain contemplated legislative measures, in that colōny.

The last New Zealand mail[2] brought me the following intelligence:—"The joint committee of the two Houses of Assembly appointed to consider the subject of our *lunatic asylums*, have agreed to the following resolutions, which are to be moved in the Legislative Council by the Hon. Dr Buchanan:"—

(1.) "That the asylums in the colony have not, save in some localities, either proper or sufficient accommodation for the reception and care of lunatics."

(2.) "That it is expedient that the *General Government* should take measures to cause proper provision to be made in those parts of the colony where the present provision is insufficient."

(3.) "That *a* duly-qualified medical officer from the United Kingdom, having special knowledge and experience in the treatment of the insane, be forthwith engaged and appointed, and who shall have the supervision and control over all the lunatic asylums in the colony."

(4.) "That the question of a *General Central Asylum* be postponed until next session, by which time information will have been obtained from reports of the inspecting medical officer, which will serve to guide the action of Parliament."

(5.) "That whilst steps should be taken to improve *all* the asy-

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contained in a paper on "The Family System as applied to the Treatment of the Chronic Insane," in the Journal of Mental Science, vol. xvi. (1871), p. 526, in which a Central Board for New Zealand is, a second time, strongly recommended.

[1] "Insanity in British Emigrants of the Middle and Upper Ranks."—Edin. Medical Journal for September 1869, p. 214.

[2] That which arrived in the beginning of January 1872.

lums in the colony, the state of that at Karori,[1] near Wellington, urgently requires immediate attention and reform."

(6.) "That the Honourable the Speaker be requested to transmit a copy of these resolutions to the Honourable the Colonial Secretary for the consideration of the Government, with the view of their being carried into effect."[2]

The following observations will be confined to a commentary on clause 3 of the foregoing resolutions. Assuming that the New Zealand Government recognises the importance of possessing at least *one Inspector* of Lunatic asylums for the colony, my present object is to discuss *what ought to be* his—

(1.) Qualifications.

(2.) Emoluments.

(3.) Duties.

(4.) Status—in relation, on the one hand, to Government and the public; and, on the other, to the medical or other authorities of the Provincial lunatic asylums.

(5.) Mode of selection and appointment.

Unfortunately, our colonies do not always "ride when they put on their spurs." Parliamentary bills are not always passed even when introduced, nor introduced when promised; so that the lunacy progress and reform at present looming on the political horizon of the colony *may* still be a thing of the distant future! So long ago as 1846, in clause 8 of the New Zealand "Lunatics Ordinance" of that year, it was enacted that "it shall be lawful for the Governor to nominate and appoint some fit person *or persons* to be visitor *or visitors* of such lunatic asylums within the colony; and to remove and displace the said visitor or visitors, and to appoint another or others in his or their stead: The persons so appointed shall visit such asylums and make reports thereon at such times and in such manner as the Governor shall from time to time direct and appoint." The intention of the Governor—then Sir George Grey—was obviously more liberal twenty-five years ago than is that of the Government of the present day, inasmuch as he contemplated, even in the infancy of the colony, the possibility at least of requiring *more than one Visitor* of the colonial asylums. No appointment, however, of a visitor or inspector has yet taken place,[3] and the natural result is the state of things now deplored by "the joint committee of the two Houses of Assembly." It is perhaps better, nevertheless, that such a delay should have occurred—provided the *right* man is *now* procured for the very difficult position he will be called upon to occupy—than that the example of certain others of our colonies, or of the United States of America, should have been followed by the appointment of an *in*competent person.

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[1] I do not appear myself to have seen the Karori Asylum (which is the Provincial asylum—for the province of Wellington, as well as for the city of Wellington, in which the New Zealand Parliament is now held) during my visit to Wellington in January 1862; but Major Blewitt, then of H. M. 65th Regiment, described it to me as situated about three miles inland; as consisting of a miserable small wooden hovel; and as inferior in character to the asylums of Auckland and Nelson, which I will have occasion by-and-by to describe in a separate paper on "The Lunatic Asylums of New Zealand."

[2] From the "Evening Star" (newspaper)—Dunedin, Otago, New Zealand, 25th October 1871.

[3] Similar delay in the carrying out of obviously necessary lunacy reform has occurred in New South Wales. So long ago as 1855, a voluminous Govern-

Already sundry and serious mistakes have been committed in consequence of the non-presence in the colony of any authority whom the Government could or would recognise or consult, *e.g.*, in the construction of the Lunatic Asylum of Dunedin.[1] It is so far fortunate that the old asylums at Nelson and Wellington still exist, while in other provinces or towns there are as yet no separate asylums at all; so that in these localities Government has now the opportunity of erecting *model* institutions, suitable to the requirements of the districts in the centre of which they ought to be planted.

Though the following remarks have special and immediate reference to *New Zealand* as the colony with which I am most familiar, and that in which I take the most vivid interest, they are equally applicable, *mutatis mutandis*, to British colonies as a group; and my suggestions are based on personal inquiry, made not only in New Zealand, but also in Australia, Canada, and the United States of America, as well as in the chief countries of continental Europe, in addition to the United Kingdom.

I. *Qualifications of a Colonial Commissioner*[2] *in Lunacy.*

It appears to me impossible to exaggerate the importance, to the lunacy system of a new country, of the qualifications of the authority or authorities who may be called upon to cast its first framework. In a young colony it is possible, nay it is easy—provided a Commissioner possess the requisite qualifications and is properly supported by his government and the public—for him to frame its lunacy system, its lunacy laws, and the regulations for the construction and organization of its public asylums, in such a way as to become a *model for imitation by other countries!* But, unfortunately, colonial

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ment "Report from the Commissioners of Inquiry on the Lunatic Asylums of New South Wales, with Minutes of Evidence, Appendix, and Replies to a Circular Letter," was published, containing strong recommendations of a revolutionary character. Thirteen years later, Dr Manning published his exhaustive official report, also containing a series of still more valuable and suitable recommendations. But, though certain changes were recently made, including the appointment of Dr Manning himself to the charge of the Gladesville Asylum, near Sydney, and to the Inspectorship of the lunatic asylums of the colony, his last official report (1871) shows that no radical change has yet occurred as regards the obviation of the evils complained of in 1855!

[1] *Vide* paper in the British and Foreign Medico-Chirurgical Review, for October 1869; footnote, p. 483.

[2] I use this term preferentially, because the word *visitor* or *inspector* represents only *one* of the many duties of such an official in a new colony; and not the most important of his duties, according to my view thereof.

legislators, with an overweening confidence in everything that is of *home* growth, and with an inordinate penchant for *home* precedents and *home* models, because they are of and from home, usually frame their lunacy laws and construct their asylums after the fashion of the faulty ones of *England*.[1] They act upon the adage, "There's no place like home," in a mischievous and absurd way—ignorant or oblivious of the fact that the lunacy system of England is admittedly corrupt, and that it cannot easily be reformed in an *old* country abounding in prejudice, vested interests, time-honoured customs, and hereditary creeds, however ridiculous or noxious these may be shown to be. In New Zealand the time has probably gone by when the greatest amount of good might have been effected by a competent government adviser in lunacy. For laws have been enacted and amended,[2] and asylums built, after the orthodox English fashion; and *after* money has been sunk and laws have taken hold, it is not easy to undo and substitute, however desirable progress or reform may be. On the other hand, there are several important provinces without proper asylums—*e.g.*, Nelson and Wellington; while there is still an opportunity of extending and simplifying the existing lunacy laws, so as to meet, for instance, the case of those pests of colonial society—the habitual drunkard or inebriate.[3]

The literal qualifications of the Inspector now required by the New Zealand Government are of such a vague and commonplace kind that they would include the *assistant*-physicians of British lunatic asylums. Possibly it is from *their* ranks that an inspector will have to be selected, for the simple reason that men occupying better positions will decline to exchange the comforts and advantages of *home* for the hard work and great responsibilities of a colonial inspectorship, for the dangers of colonial travel, for the discomforts of exile from home and friends, and for the wretched emoluments which are generally offered by colonial authorities. Hitherto colonial inspectors have been usually manufactured out of colonial asylum superintendents, who were originally *assistant*-physicians in British asylums. But I know of no case in which such inspectors would have suited the requirements of New Zealand, or of any colony whose ambition it is to frame a lunacy system that would do credit to it as a British colony. Nor could I recommend any assistant-physician of any British asylum as suited for a post, the qualifications of which are of so peculiar a kind as the inspectorship of lunatic asylums in New Zealand. Indeed, the desirable experience should be so varied and so extensive that very few Physicians-in-chief of British asylums are qualified for so difficult an office, even were they willing to exchange good positions or prospects at home for an undesirable position abroad. The qualifications requisite in the physician or assistant-physician of an ordinary British lunatic asylum are by no means of a common kind. Hence it happens that even in Britain, with its numerous medical schools and hosts of legally-qualified physicians and surgeons, it is sometimes difficult or impossible, under certain circumstances, to obtain a physician or assistant-physician whose qualifications are satisfactory to an experienced chairman of directors or physician-in-chief; and this difficulty arises, notwithstanding full advertisement both in the medical and general press. Of this I could easily cite certain recent instructive illustrations, including the case, for instance, of large emoluments failing to secure a single candidate eligible, in the opinion of, or acceptable to, a board of directors; or of physicians-in-chief preferring to do the work of several officers rather than submit to the infliction of the nominal aid of, and probable annoyance by, incompetent colleagues or subordinates! In all such cases there may be, and generally is, no lack of candidates of an *un*suitable kind; for in an old country, where medical practitioners are constantly being manufactured in large numbers by our universities and medical schools, many of them inevitably going to the wall, failing in the race for fame or fortune or in the struggle for bare subsistence, there can never lack *candidates of some sort* for every species of medical appointment, and particularly for such as offer a fixed competent income to the disappointed and unsuccessful. But, on the other hand, it is not every medical man that possesses the special qualifications necessary for the successful management of the insane—the government of a public institution with its large staff of different grades of officers—and the maintenance of proper relations with the friends of his patients, his board of directors, and the general public.[1] On the other hand, duly qualified physicians, who know the market value of their experience and reputation, will not wittingly condescend to accept inadequate salaries, inferior status, or uncomfortable relations to their fellow-officers or to boards of directors. In other words, *proper* candidates do not respond to attractive advertisements, sometimes because the salaries and other allowances offered are utterly inadequate inducements to the acceptance of office; sometimes because even the highest salaries offered in this country are regarded by sensible men as insufficient to atone for all the *miseries arising from false position*—the fruit of mis- or over-government by boards of managers, of the vagaries of directors ignorant of the requirements of the insane and of hospitals for their treatment, but, at the same time, jealous and fond of the power which they unfortunately possess, and of which they make sometimes most mischievous use. If such, then, be the difficulty of obtaining from among the numerous ranks of medical men in Britain, officers specially qualified for the management of British lunatic asylums, it may easily be conceived how much greater must be, and is, the difficulty of selecting from among the limited number of British asylum physicians, a gentleman possessing those very unusual qualifications that *ought to be* the attributes of a *proper* colonial commissioner in lunacy. For it is not enough that such an officer should have had abundant personal experience in the administration of a British asylum, and a thorough practical knowledge of the working of the lunacy laws of the three kingdoms. He should also possess a knowledge of the lunacy systems of other countries,[1] some of which offer *better models for New Zealand* than either England, Scotland, or Ireland. But such knowledge implies travel, and the qualifications for successful travel, and for the due appreciation and application of the opportunities it offers. Perhaps the most important country for a colonial lunacy commissioner to visit is the United States of America.[2] And yet there are very few of our asylum physicians who have acquainted themselves, (1) by personal visitation, with the numerous and important lunatic asylums of states differing so much in climate and population from Britain and from each other, and, what is of more importance, so much more closely resembling the various British colonies in their requirements (*quoad* the treatment of the insane) than does the old country; or (2) by reading, with their various lunacy laws, which, as a rule, compare most favourably with ours as to brevity and simplicity.

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[1] I will touch more fully on this subject in a separate paper on "Lunacy Legislation in New Zealand;" meanwhile, I may refer the reader to what I have said in the British and Foreign Medico-Chirurgical Review for October 1869, p. 488.

[2] There are at least three General Government statutes in New Zealand affecting lunatics and lunatic asylums, of dates respectively 1846, 1858 (amendment), and 1868 (repeal, amendment, and consolidation).

[3] On this subject the reader may consult two papers on "Legislation for Inebriates" in the Edinburgh Medical Journal for September and October 1870.

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[1] I have repeatedly found young medical men, well posted up in their profession, nevertheless *un*suitable for lunatic asylum appointments by reason of their want of common sense, of shrewdness and tact, of the administrative faculty, of the proper combination of the "*suaviter in modo*" with the "*fortiter in re.*"

No doubt, the Inspector selected by the New Zealand Government might—and undoubtedly should—supply the deficiencies (if any exist) in his experience or information by what may prove to be the only means now in his power. Prior to the assumption of duty in the colony, he should visit those countries, throughout the world, which are most advanced in civilisation (including especially each of the three kingdoms, the United States, Germany, and France), in order to inspect the most modern hospitals for the insane, and, what is of more importance, the most modern *systems of treatment*, including especially the *family system as illustrated in Belgium and Scotland*[2]—which is fully described in the paper mentioned in the footnote on page 807. He should procure (1) plans of those hospitals which most commend themselves to his notice as suitable for colonial requirements; (2) copies of the most succinct and simple lunacy laws—especially those of the United States;[1] (3) of reports of boards of lunacy or inspectors of asylums, and of hospitals for the insane; (4) of all the simplest formalities of admission of patients into hospitals; (5) of standard works on insanity and its jurisprudence; and generally of all useful published documents pertaining to the insane and their management. These public documents ought to form the nucleus of a colonial *lunacy library* of reference—to be annually added to by the publications constantly being issued from the press in Europe and America, relating to insanity and its treatment. Such a reference library would be of great use—I might almost say indispensable—not only to the colonial lunacy commissioner, but to the local legislators, and to the authorities of the different provincial asylums. The collection of such documents, and the visits to foreign countries necessary therefor, might fitly occupy six months, or even a year, prior to the assumption of a commissioner's duty. His own time would be well spent; and the cost well invested by the colony for its use in all future time. Moreover, there is a precedent in the fact that all this was done on behalf of the neighbouring colony of New South Wales some years ago by Dr Manning, now its Inspector of Asylums; and done so well that the result of his labours was the production of the best practical report—on the whole subjects necessary for the information of a colonial legislature or board of lunacy—that has yet appeared in the English, or in any other, language.

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[1] *Vide* also what I have said on this subject in the British and Foreign Medico-Chirurgical Review for October 1869, p. 486.

[2] The special excellences of whose lunacy laws and lunatic asylums I have enumerated in a paper on "American Hospitals for the Insane, compared with those of Britain," in the Edinburgh Medical Journal for December 1870.

II. *Emoluments of a Colonial Lunacy Commissioner.*

Most extraordinary appear to be the ideas of colonial government authorities regarding the market value of the services of British physicians highly trained in the special department of lunacy. They bid invariably for the services of first-class men—of great experience, and of acknowledged ability; but they commit the folly of expecting such men to sacrifice all their home advantages, and emigrate to a distant colony, where their duties and responsibilities must be infinitely greater, their personal comforts or pleasures infinitely less, than in the dear "old country"—dear even to colonial-born children of settlers from Britain. And for what? A salary generally much below what even a second-rate man can command at home. There may be, and probably there are, men to whom it would be a great inducement to have the opportunity of moulding or forming the lunacy system of a new country: and to such men such an opportunity would count for more than mere *salary and allowances.* But there is no guarantee, and indeed small likelihood, that a colonial lunacy commissioner, however experienced and able, will be permitted to carry out his own ideas at the public expense: for, just as at home, there are such obstacles to progress in *all* our colonies as official red-tape; public prejudice, ignorance or apathy; and political intrigue that will sacrifice everything to party and power for the moment. Even the enthusiast, however, must live; and he must make due provision for his own old age, and for his family, or other dependents. Practically, there can be no doubt that it is *salary* that usually or mainly determines the acceptance or non-acceptance of colonial lunacy appointments by British physicians; and it is a simple fact that, as yet, no first-class man has been induced to accept any of these appointments: while those second-rate men who have done so, have, in several instances at least, lost little time in finding their way home again. In New Zealand, £600 a year is apparently regarded as a handsome salary for a government or public official. This is what the New Zealand Government gives the Director of its Geological Survey; what it proposes to give to a Colonial Secretary of Education; what the University of Otago has given to each of its four Professors. But, even at home, third-rate men can easily command, and do occupy, positions yielding higher emoluments; besides possessing comforts, which no similar position in New Zealand *can* possibly offer for many a year. In order to show how utterly inadequate such a salary will be to secure for New Zealand, or any other colony, a *competent* lunacy commissioner; and in order to give the New Zealand Government a basis for its calculations as to the salary and other allowances it *ought to offer* to such an officer,—I venture to tabulate certain financial statistics, which form part of a much larger mass of similar statistics, collected for a different purpose and arranged in 1870.

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[1] The Inspector-elect for New Zealand should go by San Francisco—across the American continent, and through some of the principal States of the Union—stopping here and there to visit the best American asylums, and to confer with the leading lunacy authorities. Not only is it the quickest and most pleasant route, but it is in all respects ultimately the most *profitable.*

The said tabulation is confined to the emoluments of British and other *medical practitioners in lunacy*.[1] But it is far from representing adequately their *maximum* emoluments. For, in the first place, the highest emoluments are probably those of the physician-proprietors of *private* asylums,—of whom several in England—one or two in Scotland and Ireland—in all probability make an annual income considerably greater than that of the Lunacy Commissioners of England, who are the best paid lunacy officials in the United Kingdom. We have not, in the case of these private practitioners, the same means of ascertaining their emoluments as in that of lunacy commissioners or other government or public officials, viz., blue-books, asylum reports, or the written statements of secretaries or treasurers of public boards. So that, in their case, the exact, or even the average or approximate, emoluments cannot be quoted. It is obvious, however, that they must be of a more fluctuating character than the fixed salaries of public officers. Secondly, in many cases the salary quoted is that of recent appointments. But an officer who has spent ten to twenty years or upwards in the service of a public asylum, and whose faithful and zealous labours have commended themselves to its directors, usually obtains an increment of salary—in some cases to an extent that doubles the original amount; in other cases adding to it by as much as £300 a year. In some instances there is a fixed annual increment with length of service. Thus, in the new asylum for the city of Newcastle-upon-Tyne, the physician's salary (I am told) begins at £250; but rises by £50 a year to £500—his additional allowances being board and lodging, including wine, and three servants. Thirdly, it is most difficult to estimate the value of what are called *allowances:* which include detached house, or apartments in the asylum, for the physician and his family; household furniture and fixtures; fuel and lighting; washing; attendance—including both men and maid servants; garden produce—including fruit; dairy or farm produce—including milk and potatoes; the use of carriage or horses. House-rent, for instance, varies extremely according to the value and position of the house. Several British asylum superintendents live in handsome villas that cost between £2000 and £3000; and such houses in the suburbs of London, Dublin, or Edinburgh would bring an annual rent of £100 to £200; but, in the provinces—especially when quite in the country, several miles distant even from the county town—the assessed rental of such a house may be only £50 to £70. Again, it must be obvious that the value of coals, gas, garden and farm produce, meat and bread, must be greater in or near large cities, such as London, Dublin, or Edinburgh, than in purely rural districts, such as Devonshire or Somersetshire. Unquestionably, the best judges of the value of the various *allowances* above mentioned are the gentlemen who enjoy them. A few illustrations will show how greatly it varies in different cases. Thus, the present Physician-Superintendent of the Bloomingdale Asylum, New York, told me, when I visited him in April 1870, that he regarded his consultation practice as worth from £200 to £300 a year; and his board and other allowances as equal in value to his official salary = £1000 a year. Dr Pliny Earle, of the Massachusetts State Asylum at Northampton, described, when he visited me at Perth last summer (1871), his keep as equal to his salary—that is, worth £500 a year (= 2500 dols.) Dr Manning—in his admirable Report on the Lunatic Asylums of Europe and America—says that an income of or equal to £1000 to £1200 (= 5000 to 6000 dols.) a year is not uncommon among the Physicians to the United States Lunatic Asylums—seeing that they usually have handsome board for themselves and families, in addition to a residence, with use of carriage and horses, and other advantages. In the West Riding of Yorkshire Asylum at Wakefield, the allowances—which include "everything found" except wines and spirits—are estimated as equal to the officer's salary. In the Melbourne Asylum, £400 a year is their equivalent in money. In the case of one of the two physicians to the Hanwell Asylum, near London—who has board as well as residence—his allowances are probably equal to £300 a year. In the Carlow District Asylum, at Maryborough, Ireland, the allowances—which include furnished house, bread, milk, butter, vegetables, coals, gas, washing, and attendance (two servants)—are valued at £200 a year. The sum temporarily allowed to the recently appointed Superintendent of the New Royal Infirmary of Edinburgh for *house-rent* is £80 a year. Even in the case of asylum *matrons*, allowances are valued at £150 to £200 a year. Thus, the Matron of the North Riding of Yorkshire Asylum at Clifton has £150 "in lieu of rations;" while the Matron of the Middlesex Asylum at Hanwell has, or had recently, £120 in lieu of board; with the wages of two servants, paid by the county; all her cooking done in the asylum kitchen; provisions from the asylum stores at cost (contract) price; washing in the asylum laundry; furnished apartments; coals and gas—the total certainly equal to at least £200 a year.

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[1] On this subject, the reader may also consult Dr Manning's "Report on Lunatic Asylums," 1868, p. 80.

I have no doubt that the estimated total money value of the official position of the physicians enumerated in the following table is *under*-rated and *under*-stated; but to what (varying) extent, it is impossible for me to discover or specify. I cannot, therefore, hope that the said table is perfectly accurate in its minutiæ. But I believe it to be sufficiently so for all present purposes—for which all that is necessary is an *approximate* statement. It has to be noted also, that the emoluments quoted are not cited as illustrations of *adequateness* to the positions occupied. On the contrary, if they are contrasted with the emoluments of many other professional men, of a comparable class as to culture and rank, they must be regarded as more or less *in*adequate! For instance, I might point to—

(1.) Medical appointments in India, where one college contemporary has £2400 a year (= 2000 rupees a month) as Sanitary Commissioner; while another had £1200 a year (= 1000 rupees per month), besides a house, as superintendent of a botanic garden: both of them entitled to correspondingly handsome retiring allowances.

(2.) The clergy, and especially the dignitaries, of the English Church, and some of those of the Scotch and Irish Churches.

(3.) The head-masters, or ordinary masters, of certain English public schools, such as Eton and Harrow.

(4.) Certain professors in the Universities of the three kingdoms, of Germany, and of certain British colonies.

(5.) Certain sheriffs-substitute and procurators-fiscal of Scotland.

(6.) The town-clerks of certain Scotch cities.

(7.) The governors of certain British prisons.

The illustrations contained in the following Table are given simply as showing the current market value—(a value which has risen greatly of late years with the increased value of other kinds of labour, and which continues to rise in all parts of the United Kingdom)—of the services of the middle or ordinary, and higher, grades of British medical lunacy practitioners.

Country and Official Position.	Annual Salary.	Other Allowances.	Probable (Total Minimum) Annual Value of Office.
I. ENGLAND :—	£		£
1. *Board of Lunacy*—Six paid (or acting) Commissioners; three Medical and three Legal; each at	1500	Travelling expenses, at a fixed rate per day, . .	1500
2. *Visitors of Chancery Lunatics*—Two Medical, each at	1500	Do. do.	1500
3. *Physician-Superintendents of County or other Public Asylums*—			
1. Wakefield, W. Riding of Yorkshire—			
Present occupant, . . .	500	Furnished house; board, attendance, and washing for self and family; use of carriage and horses, . .	1000
Previous occupant, . . .	1000	Do. do.	1300
2. Brentford, Essex, ...	800	Apartments; coals, gas, vegetables, washing, . .	900
3. Northampton, ...	800	Unfurnished house; coals, gas, vegetables, . .	900
4. Bethlem, London, ...	750	Apartments, partly furnished; coals, gas; pupils' fees,	850
5. Prestwich, Lancashire—			
Previous occupant, . . .	750	Apartments; coals, gas, washing, ...	850
Present occupant, . . .	600	Do. do.	700
6. Lincoln, ...	650	Furnished house; coals, gas, vegetables, washing, .	750
7. Lancaster, ...	600	Do. coals, gas, washing, milk, vegetables,	700
8. Clifton, North Riding of Yorkshire,	600	Do. do. and garden produce, .	700
9. Colney Hatch, London—			
Two Physicians-in-chief, each at .	600	Lodging; coals, gas, butter, milk, and vegetables, .	700
		One of them with class fees,[1]	700
10. Hanwell, London—			
Two Physicians-in-chief; one at .	600	Detached house, furnished, free from rates and taxes; coals and gas, ...	700
The other at	400	Board and lodging for self and household, . . .	700

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[1] As Professor of Psychological Medicine in King's College, London.

Country and Official Position.	Annual Salary.	Other Allowances.	Probable (Total Minimum) Annual Value of Office.
I. ENGLAND—*continued.*	£		£
11. Derby,	400	Furnished apartments; board for self and family; attendance (three servants),	700
12. Wells, Somersetshire,	500	Furnished house, free from rates and taxes; coals, gas, milk, vegetables, washing,	600
13. Worcester,	600	Furnished house (detached); coals, gas, vegetables, and washing; consultation practice,	800
14. Devizes, Wiltshire,	500	£100 in lieu of board; furnished house; garden produce, washing,	700
15. Arlesey, Hertfordshire,	550	Furnished house; coals, gas, washing; half an acre of garden ground,	650
16. Abergavenny, Monmouthshire,	550	Furnished house; gas, and use of gardens,	650
17. Rainhill, Lancashire,	450	Board and lodging (furnished house),	750
18. Exminster, Devonshire,	500	Furnished house; coals, gas, vegetables, washing,	600
19. Haywards Heath, Sussex—			
Previous occupant,	650	Do. do.	750
Present occupant,	500	Do. do.	600
20. Durham,	500	Do. coals, gas, washing; farm produce,	600
21. Glamorgan,	500	Unfurnished house; gas, and use of garden,	600
22. Carlisle,	500	Unfurnished house; garden; coals, gas, washing, pony,	600
II. SCOTLAND:—			
1. *Board of Lunacy*—Two Medical Commissioners, each at	1000[1]	Fixed allowance for travelling expenses,	1000
Two Deputy Medical Commissioners, each at	600	Do. do.	600
2. *Physicians to the Royal Asylums*—			
1. Edinburgh,	800	Detached house (furnished); class fees; consultation practice,	1000

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[1] According to the Public Boards (Scotland) Commission of 1870; but £1200 according to sect. iv. Act 20 and 21 Vict. cap. 71.

Country and Official Position.	Annual Salary.	Other Allowances.	Probable (Total Minimum) Annual Value of Office.
II. SCOTLAND—*continued.*	£		£
2. Glasgow, ...	800	Apartments, partly furnished; coals, gas, vegetables, washing; beef and bread at contract prices; consultation practice, ...	1000
3. Dumfries, ...	550	Detached house; boarders; coals, gas; use of carriage; consultation practice, ...	800
4. Montrose, ...	500	Detached house; carpets, garden, coals, gas; use of carriage; consultation practice, ...	600
5. Aberdeen, ...	500	Detached house; class fees; consultation practice, .	600
III. IRELAND:—			
1. *Board of Lunacy*—Two Medical "Inspectors and Commissioners of Control of Asylums," each beginning[1] at .	900	....	1000
2. *Physician-Superin. of Public Asylums*—			
1. Richmond Asylum, Dublin, . .	550	Unfurnished apartments; fuel, light, bread, milk, vegetables, and washing,[2]	650
2. Cork District Asylum, . . .	430	Fuel, light, washing, and garden,[3]	580
IV. AUSTRALIA:—			
Physician-Superintendents of Colonial Asylums—			
1. Victoria, Melbourne—			
Present occup., £800 for first two years:	then 900[4]	£400 in lieu of sundry allowances, ...	1300
Previous occupant, ...	610	House and other allowances, ...	800

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[1] There is, however, an annual increment, but at what rate and to what maximum I am not aware.

[2] In the printed Annual Reports of the Asylum (*e.g.*, in that for 1868), the "estimated annual value" of these allowances is set down at the very low figure of £100, 14s. 5d.

[3] In the printed Annual Reports of the Asylum, the "estimated annual value" of these allowances is placed at the high figure of £150, while residence is omitted.

[4] It is probably more now, seeing that he has since been appointed Inspector of Asylums for the colony of Victoria.

Country and Official Position.	Annual Salary.	Other Allowances.	Probable (Total Minimum) Annual Value of Office.
IV. AUSTRALIA—*continued.*	£		£
2. New South Wales, Sydney—			
1. Tarban Creek—Previous occupant, .	650[1]	Apartments; £45 in lieu of fuel and light; washing, .	1000
2. Parramatta—Previous occupant, .	600[2]	Detached house, ...	700
V. CANADA:— *Physician-Superintendents of Provincial Asylums*—			
1. Toronto, ...	1000 (=$5000)	Apartments; board for self and family; class fees,[3] .	1500
VI. UNITED STATES:— *Physician-Superintendents of State or other Public Asylums*—			
1. Bloomingdale, New York, . . .	1000 (=$5000)[4]	Detached house; board for self and family; consultation practice; use of carriage and horses, . .	2200
2. Northampton, Massachusetts, . .	500 (=$2500)	Residence and board, ...	1000
3. Utica, New York, ...	700 (=$3500)	Furnished apartments; board for self, wife, and family,	1200

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[1] The income of the present occupant is probably considerably greater, apart from his being "Inspector of Asylums" for New South Wales, as well as Physician to the Asylum at Gladesville. In the Report of the Commissioners of Inquiry on Lunatic Asylums in New South Wales in 1855 (p. 12, quoted in Dr Manning's Report, p. 156), these gentlemen recommend that the medical head of a proposed new colonial asylum "should be provided for in all domestic particulars at the public expense, and should have an independent salary of *at least* £750 a year:" in other words, that he should have board as well as lodging, attendance, and washing—which ought to be equal to at least another £500 a year—representing *a total of* £1250.

[2] The late Dr Greenup was also Medical Adviser to Government, and perhaps had an additional income from this source, as well as from private practice.

[3] Formerly Professor of Midwifery and Diseases of Women and Children in the School of Medicine connected with the University of Toronto.

[4] Reckoning the American dollar as equivalent to 4s. English: 5 dollars = £1.

Now, it may be laid down as only a fair proposition that, in order to induce a physician of any experience and reputation at home, who has or expects good prospects there, to accept a colonial lunacy appointment, with all its drawbacks, he ought to be offered *double* the emoluments he can command in Britain. It is not enough to bear in mind the much higher price of living[1] and travel[2] in the colonies—the much greater cost of menial labour[3]—the difficulty of obtaining the luxuries, and sometimes even the ordinary comforts, of life in a young colony.[4] There is much more to be made amends for, in asking a professional cultivated man of good status at home to exile himself to the antipodes. It is, for instance, impossible to atone, to a man of high culture, by *any* salary whatever, for the loss of literary or scientific society; for want of access to books of reference—to all the advantages which our large cities offer to the educated—to the holiday fields, of the most varied and charming kind, that are presented by Switzerland, Italy, Germany, Norway, the shores of the Mediterranean—though it is not to be forgotten that New Zealand possesses some magnificent scenery and certain other natural phenomena that can rival those of Switzerland, Italy, Sicily, or Iceland.[5] In a wild country, such as New Zealand still is on the whole, the *danger of travel* is so great and so real that not only did I meet with several accidents myself that might have been serious enough—while during my stay in the colony numerous fatal accidents from shipwrecks to coachwrecks occurred; but not a few of the public men of New Zealand have died suddenly by accident, sometimes in the course of journeys necessarily undertaken in connexion with their official duties or position, while others have been disabled permanently or temporarily by non-fatal accidents. Thus the superintendent (*Anglicè* governor) of the province of Nelson—with whom I had an interview, and subsequently correspondence, relating to certain contemplated reforms in the local lunatic asylum—died by drowning on the west coast of the said province.[6] My old schoolfellow and friend,

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[1] The cost of *firewood* alone in certain colonies (*e.g.*, Canada) is a serious item of annual expenditure.

[2] In the absence of railways, travelling by *coach* frequently costs as many pounds as the same distance would cost shillings per railway at home.

[3] Where servants are to be obtained at all, they cost at least four times as much as at home.

[4] In Wellington—the parliamentary capital of New Zealand—all buildings are of wood, in consequence of its liability to earthquake shocks.

[5] For instance, the fiords of the west coast of Otago, the inland lakes of the same province, the Mount Cook region of Canterbury, the volcanic district of the North Island and of White Island, including Lake Taupo, Ruapehu, and Tangariro.

[6] *Vide* paper in the British and Foreign Medico-Chirurgical Review for October 1869, p. 481. On this subject Capt. Rough, then of Nelson, wrote me in May 1865,—"I owe you many thanks for your kind attention to my note on the subject of our lunatic asylum. The Government must now act on your suggestions regarding proper provision for attendants, or allow the poor

J. M. Balfour, C.E., of Edinburgh, and afterwards Provincial Marine Engineer of Otago, was more recently drowned in the course of one of his ordinary official visits of inspection on the east coast of that province. Dr Sinclair of Auckland, sometime Colonial Secretary, to whom I carried letters of introduction, had been drowned before my arrival in one of the Canterbury rivers, while on a botanical expedition with Dr Haast, the accomplished Government Geologist of the latter province. Again, my friend John Hislop, Esq., of Dunedin, whose name is identified with the origin and development of the admirable Education Scheme of Otago—the best that exists in New Zealand—had his leg or arm broken by the smash of a coach,—a sort of accident in which I have myself figured, though with more fortunate result.

Many of the physicians of British asylums have sundry means of adding considerably to their *official* salaries. Some of them have insane *boarders*, who do not pay less than £100—sometimes £200 or £300—a year each. Several are *lecturers* on insanity in universities or medical schools. Generally the classes are small, and the total fees—at one, two, or three guineas each student—cannot amount to an annual sum of any importance. But in other cases, where the class is, or has been, large, the income may form a respectable addendum to the physician's other emoluments. Many of them have *consultation practice in lunacy cases*—a somewhat vague and pretty extensive category, that includes numbers of mere "nervous invalids," and persons of vicious habit, or of defective mental power or application, among the higher classes. Indeed, as a general rule—whether or not it is specifically permitted by boards of directors—the British asylum physician is the natural consultant for his district, in lunacy cases; and in or near large towns a practice of this kind becomes sometimes so lucrative that it is much more valuable than the official salary. Thus, I know of one case in Scotland in which, the official salary being £500, the income from private practice was £900—making a very respectable total of £1400 a year. He would indeed be in sorry practice as a consultant in lunacy in or near such cities as the capitals of the three kingdoms—or as Manchester, Liverpool, or Glasgow—who made less than £500 a year. For visits to patients in the country, physicians engaged in lunacy practice in Edinburgh charge single fees of fifteen to thirty guineas, and I have heard of as much as £50 being paid as a single ordinary fee. All asylum physicians also draw a certain revenue from the fees of official *certificates*—such as those required in cases of curatory petitions to the Court of Session in Scotland, or for admissions into, or transmissions to, other asylums. In the large asylums, the fees from this source alone

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patients to remain exposed to the treatment of untrained and ignorant persons. Poor Mr Robinson was drowned at the west coast; and what his successor, Mr Saunders, may do in the matter, I do not know. He appears to be well disposed."

probably amount to not less than £100 a year. There are certain other kinds of certificates, which many asylum physicians grant *gratuitously*—though they are under no obligation to do so, or to grant them at all: and even at home the friends of patients, and the general public, are too often meanly ready to exact if possible, or to accept where offered, the *gratuitous* (extra-official) services of asylum physicians!

A Lunacy Commissioner in a young colony can scarcely take boarders, or deliver lectures to a class of medical students. But he is a natural and proper *consultant* in all forms of insanity and allied nervous disorders; while the peripatetic character of his official inspections—leading him periodically to visit the different provinces of such a country as New Zealand—give him an advantage that local (fixed) practitioners, even if equally eminent, cannot possess.[1] I know from experience that in this form alone—that of a consultant in insane and nervous cases throughout the colony —a properly qualified expert from home would, or at all events might, prove of inestimable value to the colonists; for I found in all parts of New Zealand extreme timidity and reluctance on the part of physicians to mix themselves up in any way with lunacy matters: the result of which was the gross mismanagement of many cases among the higher classes. The income of such an expert in such a colony might easily be at least £1000 a year. But it might not be considered, by the colonial government, proper—as apt to afford ground for future misunderstanding or complaint—to permit a Lunacy Commissioner to engage in any form of consultation practice, or to do ought else than devote his whole time to the discharge of his official duties. That is to say, Government may prohibit extra practice or service for direct money remuneration. But of this I am quite certain, from my own experience, that the colonists will take very abundant, and possibly very mean, use of his *advice gratis!*[2] Colonial governments are in the habit of buying the services of their officials at the cheapest rates, while exacting the greatest amount of service, whether paid for or not; and there is not only a danger, but a probability, that this will be the position of a Lunacy Commissioner, unless he take good care, from the first, to *define his position* both in respect of *emoluments and duties.* It is obvious that if such an official is to be prohibited from such a source of emolument and from such a sphere of usefulness as that of private consultation practice, or from any of those other means of eking out an official income which are common to the Alienists of Britain, his *official salary ought to be correspondingly greater.* Considering the amount of income from non-official sources enjoyed by many asylum physicians in Britain, and bearing in mind the rule that a colonial salary is practically equal *only to one-half* a British one, it is a very moderate computation to regard restriction from private practice in a colonial lunacy commissioner as equal to a loss to him of £1000 a year.

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[1] On this subject, the reader may consult Dr Manning's Report, p. 203.

[2] While myself travelling in New Zealand, all sorts of stratagems were resorted to for the purpose of securing my professional opinion in all manner of surgical and medical, insane and sane cases, *gratis.* Even what was virtually compulsion was sometimes used. And so far from being one penny the richer, I was forced sometimes to give advice at the cost of great fatigue and inconvenience to myself. So much for the so-called "independent" spirit of democracies

Moreover, if, as is extremely likely, a colonial lunacy commissioner is to *constitute in himself a board of lunacy*—if he is called upon to do, not only the work of a staff of inspectors, but also to discharge the functions which, in our home boards, appertain to a well-paid secretary and clerks,[1] he ought, in common fairness, to have the accumulated or conjoint emoluments of *all* these officers!

It is not enough, however, to offer a handsome official salary, which ought to commence from the date of appointment, or, at least, from that of resignation of office at home. Due provision should also be made from the first for *superannuation.* A retiring pension should not be made to depend on length of service, age, or infirmity; for an accident might occur, even on the voyage out, disabling the commissioner-elect from further, or from full future, service; and it would be obviously unjust that, in such a case, having demitted a good life appointment at home, he should have no claim on the colonial government, simply because he had not spent ten, fifteen, or twenty years in its service. The arrangement made should be of such a character as to give him the power of coming home on a comfortable superannuation allowance whenever he feels himself disabled by the strain of office, or by accident or disease contracted in the course of his official journeys. The amount and conditions of superannuation cannot altogether be determined by the superannuation arrangements of *British* lunacy authorities; for in a colony the work and responsibility will necessarily be much more severe and exhausting. The period of service should, therefore, be much shorter, the amount of pension larger, and the whole conditions more liberal. Nevertheless, British arrangements may afford a guide to the *minimum* amount and conditions; for the maximum in Britain should be a minimum in any of our colonies. Now, our Lunacy Commissioners enjoy the benefits of the civil service[2] superannuation arrangements. The last who retired after twenty years' service has a pension of £1000 a year.[1] For the superannuation of English asylum physicians, special provision is made in the lunacy statutes, the common arrangement being a grant of two-thirds or three-fourths of the total annual value of the appointment (that is, of the money-value of the allowances added to the salary) after ten to fifteen years' service.[2] Thus, of recent resignations on pension the following are illustrations:—

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[1] According to the Report of the Scottish Public Boards Inquiry Commissioners (1870), the secretary of the Scottish Lunacy Board has a salary of £600, and the chief-clerk of £300, a year.

[2] The following are illustrations taken from other departments of the civil service, according to Government blue-books (1865):—

(1.) Professor of Logic in the University of Glasgow.—Thirty-seven years' service. Annual income at time of retirement, £959, 18s.; pension, £639, 19s. per annum.

(2.) Professor of Medicine in University of St Andrews.—Thirteen years. Income, £949, 10s. 8d.; pension, £363, 19s. 9d.

(3.) Professor of Anatomy in University of Aberdeen.—Twenty-two years. Income, £625, 17s.; pension, £323, 7s. 1d.

(4.) Professor of Divinity in University of Glasgow.—Twenty-two years. Income, £674, 4s. 8d.; pension, £348, 7s. 1d.

(1.) East Riding of Yorkshire Asylum.—Pension, £575; eighteen years' service; equal to two-thirds of salary and allowances.

(2.) Somerset County Asylum.—£450, after twenty years' service.

(3.) Kent County Asylum.—£450, after seventeen years' service, being nearly two-thirds.

(4.) Derby County Asylum.—£400, after twenty-one years' service, being two-thirds of salary and value of allowances.

(5.) Gloucester County Asylum.—£350, after seventeen years' service.

(6.) Bristol (City) Asylum.—£250, after ten years' service; while Oxford gave the same sum only after twenty-three years' service.

(7.) Lancashire Asylum at Prestwich gives a pension of two-thirds after twenty years; while that of

(8.) Durham County gives the same amount after fifteen years' service.

Similar arrangements exist in the county or district asylums of Ireland and Scotland. Though there are many instances in these countries and their asylums of the superannuation of the subordinate officers on handsome allowances—sometimes on *full pay* after an unusually prolonged or efficient service[3]—there are no recent cases of the retirement on pension of the *physicians*. Several cases have lately fallen under my notice, however, of army and navy surgeons retiring on from £400 to £550 per annum after twenty to thirty years' service. The only *colonial* illustration with which I am acquainted is the case of the physician of the Yarra Bend Asylum, near Melbourne, Australia, whose pension is £600 a year after twelve years' service.[4]

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[1] It is said that both in England and Scotland the Commissioners retire on full pay after twenty years' service.

[2] The *British Medical Journal* of 29th April 1871, states that the superintendents of English asylums now retire, on three-fourths of the total annual value of their appointments, after fifteen years' service. The *Lancet*, in April 1863, stated that it was proposed to grant to poor-law medical officers pensions after ten years' service.

[3] An illustration is given in the Thirty-sixth Annual Report (1863) of the Murray Royal Institution, Perth, p. 23; and in the same Report (pp. 25–28) the whole subject of *superannuation of asylum officers* is discussed. It is also touched upon in the Thirtieth Report (1857), p. 36.

[4] Dr Stewart, of the Tarban Creek Asylum, New South Wales, was entitled to a retiring pension after ten years' service; but on what scale I am not aware.

Provision must be made, however, for more than salary and superannuation. An adequate sum must be offered for *outfit and passage*, as well as for *official apparatus;* while proper provision must not be omitted for annual *holiday* rest or relaxation. Moreover, as I have already suggested, Government should defray the cost of, and not grudge the time occupied by, a systematic inspection of the lunacy systems of the leading nations of the world. Now, in the case of the physician of the Melbourne Asylum, sent for to this country some years ago, the allowance for outfit and passage was £150 for an unmarried man, and £370 for a married couple, this being intended to cover the expense of the overland journey (*via* Egypt and Ceylon). The four professors recently appointed to the University of Otago had each £150 for outfit and passage. Each professor had, moreover, a grant of £50 for *books* in his department, to become the property of the university library; while two of them had, in addition, an allowance of £200 for class apparatus and specimens, —also, of course, to become the college property. I have already pointed out how desirable it is that a colonial lunacy commissioner should carry out with him a full assortment of books, reports, forms, plans, and drawings; but it is equally proper that he should take with him the nucleus at least of a *practical museum of asylum appliances*,[1] which should include not only all specialties in the way of windows, doors, locks, systems of heating and ventilation, but of feeding apparatus, materials of dress, room and table furnishings, and generally of all articles that conduce to efficiency of organization or treatment by economizing labour or otherwise. The collection of such articles would entail considerable time, labour, and expense; but when completed it would be of immense advantage to all the provincial asylums of such a colony as New Zealand. For the materials to furnish a *colonial lunacy library and museum*, a sum of £300 to £500 might be profitably expended. As to *holidays*, the Deputy-Commissioners of Scotland have each two months per annum; some of the asylum physicians of Scotland have six weeks, others a month; some of those of England have two months or upwards; and Sir Henry Holland tells us, in his recently-published "Recollections" (1872), how necessary he found it to take regularly, for a long series of years, at least two months' annual holiday. But whereas that learned and laborious physician spent his holiday in *travel*—and many of our asylum physicians, whose life is, in great measure, a *sedentary* one, do the same—Commissioners in Lunacy, both at home and abroad, whose time is chiefly occupied "on circuit," in a tour of inspection of asylums or of the insane scattered in private dwellings, find their holiday in simple rest at home with their families. Neither our busy city physicians, our lunacy commissioners, nor our asylum physicians require more obviously their annual holiday than the hard-worked officials of a colonial government. It is surely unnecessary to add, that the *travelling expenses* of a lunacy commissioner while on official business must be defrayed by the colony. Whether this should be by a fixed allowance per day, as is the case in the three kingdoms, or simply by reimbursement of actual outlay, may be a matter for arrangement between the colonial government and its commissioner. Probably in our colonies, as at home, the principle of the former arrangement is to be preferred, though the amount must be much higher in a new than in an old country, where travelling by coach, for instance, costs sometimes pounds instead of shillings, while hotel charges are correspondingly exorbitant.

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[1] Such a *museum* ought to be attached to each Board of Lunacy in the three kingdoms, if it is part, as it surely ought to be, of their object to assist the authorities of the numerous local asylums, or the custodiers of the insane in private dwellings, in their constantly-recurring difficulties—in the management, for instance, of the suicidal, abstinent, destructive, paralytic, or dirty.

Occasionally subordinate asylum officers are sent for from this country, or they emigrate, seek office in colonial asylums, and by reason of their experience meet with prompt appointment at salaries usually about four times what they obtained at home.[1] Thus, the last appointed physician of the Melbourne Asylum had authority to send out two male attendants at £120 per annum, with board, lodging, and the other allowances such officers usually enjoy in British asylums. The average home wages of such officers are £25 to £30. In 1863, several former attendants, trained by myself in the Perth Royal Asylum, sought and easily obtained appointments in the new Dunedin Asylum, where the males got £100 and the females £50 a year of salary, whereas at home their wages had been £25 and £10 respectively. If the increased emoluments of physicians of colonial asylums were to bear a corresponding proportion to their home salaries, they ought to range from £2000 to £3000 a year! Nor is there any reason why the proportion between the wages of an attendant and the salary of a physician that exists in the asylums of the home country, should not be maintained in a British colony. More especially is it absurd and unjust to offer four or five times the home wage to an illiterate attendant, and less than an average home salary to a highly-educated physician! Taking a second or third rate asylum-physicianship in Britain as worth only £500 a year,[2] and assuming (1) that the occupant of such an office, were he to accept a colonial appointment, should be paid at the same increased rate as his attendants emigrating to fill subordinate posts in the same colonial asylum, and that (2) a lunacy commissioner should receive twice as much pay as an ordinary asylum physician,—the emoluments of a New Zealand Lunacy Commissioner should include a salary of £4000 a year, with a retiring pension of £1000 to £3000 per annum, according to the length or value of service. How far the New Zealand Government will approach *this* equitable standard remains to be seen!

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[1] The same holds good (*e.g.*) of governesses in Victoria, New South Wales, and New Zealand. In the celebrated inquest on Miss Mary Loftus, recorded in the *Sydney Morning Herald* of 14th December 1861, it came out in evidence that her salary as a governess had been £200 a year, or probably four times what her services would have commanded at home. The result was, that she had been enabled to accumulate a little fortune.

[2] There are cases in which the *assistant* medical officers of public or private asylums in Britain and other countries hold a position of this value. Thus—

(1.) In the New York State Asylum at Utica, there are three medical assistants, of whom the first has a salary of £300 ($1500), with furnished apartments and board for himself and family; the second (who is unmarried) has £250 of salary with board and lodging; and the third, £200, with furnished lodging, and board for self and family.

(2.) In the Royal Hospital of Bethlem, London, the medical assistant has £300, with board and lodging.

(3.) In certain private asylums in or near London, the assistant-physician has £200 to £300 a year, with board and lodging of the best kind.

(*To be continued.*)

ARTICLE V.—*Notes of Successful Operations on Aged Patients.* By THOMAS ANNANDALE, F.R.S.E., Surgeon to the Royal Infirmary and Lecturer on Clinical Surgery.

A BRIEF note of the following cases, which have occurred in my hospital and private practice during the last few years, will, I trust, not be thought uninteresting.

The results obtained in these cases prove that mere age is not necessarily a reason for withholding operative treatment, of even a severe nature, in old persons.

These results are also an encouragement to undertake operations in this class of patients, provided the patient is in fair general health, and the operation likely to prolong life, or relieve a condition which is causing suffering.

A hereditary history of long life is, I think, a further encouragement in determining the justifiability of operative treatment in aged patients.

In the first, second, seventh, eighth, and ninth of the cases, the wounds were dressed carefully according to Mr Lister's antiseptic method, and healed without local or constitutional irritation. In the third case pure sulphurous acid was applied to the wound after the operation, and during its healing, the progress of which was most satisfactory.

1. *Amputation of Arm.*—Margaret A., æt. 74, admitted into the Infirmary on the 20th of December 1871, on account of a large cartilaginous tumour growing from the bones of the forearm. Amputation through the condyles of the humerus. Dismissed cured on the 2d of February 1872.

2. *Primary Excision of Elbow-Joint.*—Mrs Y., æt. 74, having fallen in the street on the 2d of September 1871, was found to have received a compound comminuted fracture of the lower end of the humerus. The condyles of this bone were split into five portions, and the upper fragment projected for nearly two inches through the skin at the posterior aspect of the joint. Primary excision of the joint by one long posterior incision. Complete and satisfactory recovery, with a useful arm, at the end of three months.

3. *Excision of half the Tongue.*—Mrs B., æt. 71, seen on the 29th of April 1871 with Dr Dewar of Kirkcaldy. The patient was suffering from epithelial cancer, confined to the right side of the tongue. The symphysis of the lower jaw having been divided according to the method of the late Mr Syme, the tongue was split in the middle line from the hyoid bone to its tip, and the diseased half completely cut away. An excellent recovery was the result, and the patient up to this date (8th Feb. 1872) remains well, and free from any return of the disease.

4. *Removal of large portion of Cheek.*—A. P., æt. 72, admitted into the Infirmary on the 17th November 1869, suffering from epithelial cancer affecting the cheek, upper lip, and portion of one side of the nose. The entire diseased parts were removed, and a plastic operation performed to cover the large gap which remained. This patient made a good recovery.

5. *Excision of the Upper Jaw.*—Mr C., æt. 70, seen with Dr Tait of Dunse, and Dr Brown of Coldstream. A medullary tumour, the size of a closed large fist, grew from the right upper jaw-bone. The skin over the tumour was involved, but the growth did not pass beyond this bone. The affected skin and entire right upper jaw-bone were removed together with the tumour. The patient recovered well from the operation, but the disease afterwards returned and caused his death.

6. *Excision of portion of Lower Jaw, and Submaxillary Gland.*—G. U., æt. 74, admitted into the Infirmary on the 27th December 1871, suffering from a large cancerous mass affecting the skin on one side of the neck, nearly one half of the lower jaw and its periosteum, and the right submaxillary gland. There was a deep ulceration of the soft textures over the submaxillary gland, from which a serious hæmorrhage had taken place a few days before admission. The disease was removed by cutting out the affected portion of the jaw-bone, together with the ulcerated and diseased skin, and then dissecting away the submaxillary gland and muscles on one side of the tongue. The common carotid artery was exposed, and a temporary ligature placed round it as a precaution against hæmorrhage, before the deeper dissection was commenced. The operation was followed by the most satisfactory results, the large wound gradually contracted, and he was dismissed on the 8th of February 1872, in excellent health. A small opening communicating with the cavity of the mouth remained, but its margins were healed and in a sound condition.

7. *Excision of the Breast.*—M. L., æt. 70, admitted in February 1870 with a scirrhous tumour affecting her right breast. The entire breast and some glands in the axilla were removed, and a good recovery from the operation was the result.[1]

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[1] In connexion with this case, I may mention that I attended with the late Mr Syme a lady, æt. 81, whose entire breast he removed for cystic disease. This patient, and another lady æt. 70, whose breast Mr Syme also removed for scirrhus, recovered well from the operation.

8. *Removal of a Fatty Tumour.*—U. S., æt. 73, admitted in April 1870. He suffered from a fatty tumour the size of a saucer, situated under the skin over the back of his neck. As the tumour was becoming very troublesome and increasing in size, he was anxious to have it removed. This was done, and the patient made an excellent recovery.

9. *Removal of large Fatty Tumour.*—Mrs A., æt. 71, admitted 28th August 1871, suffering from a fatty tumour, the size of a child's head, situated on the inner aspect of the thigh. The skin over the tumour had ulcerated and caused a painful and troublesome condition of the growth. The tumour was cut out, and the patient recovered well from the operation, being dismissed on the 20th of September 1871.

In addition to these cases, I might add several successful operations for strangulated hernia in old people, one of the patients being seventy-eight years old, and one successful case of lateral lithotomy in a gentleman aged seventy-four; but these latter results are not so very uncommon in surgical practice.

Part Second.

REVIEWS.

Clinical Lectures on the Diseases of Women. By Sir JAMES Y. SIMPSON, Bart. Edited by A. R. SIMPSON, M.D., etc. Edinburgh: Adam and Charles Black: 1872.

WE have now before us the third and last volume of Sir James Simpson's collected writings, and it is a large, handsome, interesting book. The first volume contains the most important contributions to science which Simpson made. They were mostly published while he was yet young. The second volume has interest chiefly on literary and historical grounds, and has very little in it that can be called contribution to science. It is occupied with the history of the American discovery of anæsthesia and of his own promulgation of chloroform as an anæsthetic agent, and laboured defences of his claims as a discoverer. It contains the foundation of his wide fame. The third volume contains his own statement of his views as to gynækological theory and practice. It is well known that Simpson had an unrivalled reputation as a physician and surgeon in the diseases of women. Crowds of women came to him seeking advice; and we find in this volume an account of much of his therapeutical proceedings for their relief. So great was his renown in this department that we are compelled to enter, at once, a caveat against allowing it to influence judgment on his writings and proceedings. Renown and crowds of patients only imply the faith of the patients in the power of the physician; they imply only reputation and notoriety. It is common to suppose that reputation of this kind cannot be produced without a good substantial basis; but this natural supposition is a gross mistake. No man ever fostered the growth of his reputation more than Sir James Simpson, and he reaped the natural fruits of his care and zeal. We speak now without any special reference to the author and practitioner under review, and assert the well-known fact, that the widest and, in some senses, largest reputation may be based on nothing good or substantial; and we draw, as critics, the conclusion that renown, reputation, and crowds of clients give only a very slight and frail presumption in favour of real success in treating and curing, while they unmistakably show the presence of cleverness, worldly wisdom, ingenuity, and power to please and satisfy.

Simpson attracted universal attention to his plans of diagnosis and treatment. In diagnosis he did excellent service by showing the applications and value of the uterine probe. While this was his chief it was not his only contribution to this department; but we pass on to consider his practice. Before doing so, we must candidly tell our readers that we do not expect to find much of advancement of practice in any man's work. He who knows medicine or looks over its history will find how little any one has ever done in this department. Proposals are abundant; methods of cure are easily described and affixed to the descriptions of disease; but time generally either reduces them simply to nothing or shows that they are injurious. We have not space to enter on the philosophy of this grand subject—a philosophy so discouraging to our great therapeutical discoverers who rapidly cover and again cover the pages of the *Lancet* or the *Practitioner* with fancied new and beneficent treatments and cures. Besides the tremendous difficulties in the proper potential science of therapeutics, there is one great preliminary difficulty which it will probably take ages to overcome—our ignorance of the nature, and then our imperfection in the diagnosis, of disease. Simpson was true to himself, but very far wrong in his fundamental notions on this subject. His erroneous philosophy is probably the best excuse for his persistent introduction of wonderful new cures—his polypharmacy. His patients were only a short time under his care when they had surgical and medicinal treatment of great variety, sheaves of prescriptions delightful to credulous patients and to druggists. Leptandrin, furfurin, salts of nickel,—what not? It has been said of many such remedies that nothing is known of them but the names; we might go farther, and say that not even the names are known. Yet they cured and cure apparently just as well as other things.

Simpson's remarkable statement is this:—"Ask the medical practitioner what the nature of the difficulties is which he most frequently encounters in practice. If he will properly analyze the subject, he will confess to you that his difficulties most usually consist in exactly determining what the special disease, or diseased action, in his patient may be—not in determining what he should employ for its cure, provided he were once perfectly certain of its precise nature and precise seat and extent. The real difficulties of the practitioner do not commonly consist of doubts about the nature and details of the therapeutic measures which he ought to use; but they consist of primary doubts and uncertainties as to what the diseased action is against which he is to turn his diversified therapeutic resources. They are doubts not about therapeutics, but about diagnosis."—(P. 3.)

Just so!! For a threatened abortion, give furfurin; for a cancer, burn with sulphate of zinc; for a headache, give sulphate of nickel; for anæmia, give manganese; to remove adhesions, give a local mercurialization; to cure a fibroid, give bromine; to cure sterility, split the cervix uteri; to cure phthisis pulmonalis, give oily inhalations; to cure coccodynia, operate, and never mind though a bit of the knife is broken off and remains in the bone; try to remove a hæmatocele by the local use of mercury or iodide of lead, etc, (No doubt the etc. is as effectual as the mercury or iodide of lead.) Here is the grand medicine of the nineteenth century. If we know the disease or diseased action, we have no difficulty in finding the remedy. Would that this were other than really an egregious unintentional hoax on medicine! Would that therapeutics were waiting for advance of diagnosis! It is too true that diagnostic science is far from being far advanced; but truly therapeutics are as yet at an infinite distance behind it. We are not now speaking of that great department of medicine, the homely empirical therapeutics, founded not on science, but on public and professional confidence and knowledge of human nature, which demands the highest wisdom in the practitioner, and which, if it is not to degenerate into quackery, requires truth in the inward and outward parts.

There is a sense, however, in which Simpson's statement is true; but it is not the sense which he meant his words to convey, and it is a sense which only plunges medicine in deeper disgrace (not dishonour) than the intended one. This sense may be given in a kind of paraphrase of Simpson's words. Practitioners generally are educated well enough to know the difficulties of diagnosis; they know that a good physician has a considerable power in this way, and they are conscientious enough to feel the want of it, or to doubt their own power. But when they have made up their minds as to the nature of the disease, then their ignorance or bad education comes fully into play; they have no difficulty in prescribing; they ply their leptandrin or furfurin, or nickel or mercury, without fear or scruple. Poor and honest fellows! Ignorance is the mother of superstition. Their remedies do as well as any charm or incantation, or as an "Ave Maria, ora pro nobis,"—and that is truly doing a great deal, doing a good deed. The medicine-man of Central

Africa is a conscientious creature, just as he is in Scotland. He has no doubts about his diversified therapeutic resources. Patients in Central Africa pay their fees and swallow their drugs just as in Scotland. Such is polypharmacy as it still exists in Great Britain, and is expounded in the end of the nineteenth century by great teachers. Such is the real basis of the success of homœopathy, hydropathy, allopathy, and of every pathy;—want of science, want of scientific appreciation, credulity, want of feeling of the want of science and of scientific method, want of respect for the laws of nature; medical superstition, the same in Great Britain as in Central Africa, and equally useful in both places, but more excusable in the latter.

Simpson has in this volume a great deal of matter, chiefly of curious historical interest, on the subject of cancer. Any one who knew the man would expect that cancer cures would be some time or other a subject of his study. As might have been expected, it has come to nothing. The chapters which he devotes to the matter are worthy of perusal as a contribution to an important part of the history of medicine, and one which does not do the profession much credit.

Fibrous tumours of the uterus, a grand gynækological topic, he discusses very fully, yet far from completely. He had an overweening faith in treatment by medicines and otherwise in this disease; and he was very unsuccessful in operating for the removal of such growths. So much was this the case that he latterly discountenanced surgical interference. It is well known that in the meantime our only rational hope of removal of these tumours is by surgery, and that recently much success has been obtained in this way, both in this country and on the continents of Europe and America.

In his lectures, as originally published in the *Medical Times and Gazette*, he has no recognition of pelvic peritonitis, now called perimetritis, but dwells at length on pelvic cellulitis, now called parametritis. But it is evident that under the influence of his assistant Dr Lauchlan Aitken, and of a book which he does not name, but which is easily recognised by his description of it as "a monograph only recently published," he had greatly changed his mind on the subject of perimetritis and parametritis. He takes laboured exception to these new names given by Virchow, but this is now of no avail, for the names are meantime adopted, as any one who knows the modern literature of the subject can testify. The names, however, are matters of small importance, and not worthy of long discussion. The new chapter which he now gives on perimetritis fits badly with his old account of pelvic cellulitis. He ought either to have completely studied the subject anew and written the lectures over again, or have adopted far more extensively than he has done the views propounded in "a monograph only recently published," and which his assistant Dr Lauchlan Aitken could have expounded, modified, or corrected. This gentleman is well known to our readers as the contributor of several articles in our pages, and his works would be more highly appreciated were it more generally known that his views as published were far from being in accordance with those of his not particularly tolerant master.

Our author very early took great interest in ovariotomy, encouraged Clay, foresaw the future of this great operation, and defended it against unjust attacks then made on it from every side. His arguments were not always well laid, and sometimes his figures were quite unreliable, but he was energetic, skilful, and did good; making one of the early applications of statistics to the solution of practical questions. He operated frequently, and employed several of his young friends to operate for him. But he was not successful, and he declined, no doubt for reasons not far to find, yet surely insufficient in a man who got so much statistical aid from others, to give for publication the number of his cases and the mortality.

Dysmenorrhœa and sterility are two subjects whose treatment occupied Simpson very much, and no two diseases brought him more fame or patients. They are great subjects, and are worthy to occupy the attention of the greatest man. Simpson has merit in directing his powers to the solution of the difficult problems involved in the treatment of these diseases, and in some senses he cannot but have done much good. Yet we must add, that we have read his account of dysmenorrhœa with astonishment. To find him attributing the disease, for whose cure he applied a modified lithotome caché, to contraction of the external os uteri, creates for us a puzzle. There is no doubt it is an error, but this is not the place to discuss this point. There is no doubt that dilatation of it does not require a metrotome, and that it is not dangerous to life or to the health of the parts. Accordingly, our author writes that he believes he is entitled to say that there are few operations in surgery so perfectly simple in their performance, and so extremely satisfactory in their results, as division of the cervix uteri in cases of obstruction, dysmenorrhœa, and sterility!! Yet we are very far mistaken if it is not notorious that the operation has gone greatly out of fashion, that it is falling into comparative desuetude, and that it has been the cause of death and other disasters in very many cases. Simpson's own editor and assistant corroborates this. There is indeed room to question whether the operation has not caused much more disease and sterility than it has cured.

One of the chief diseases closely connected with the name of Simpson is retroversion of the womb or the minor displacements generally. At one time, it quite took the wind out of the sails of ulceration of the womb; it was the secret of the minor uterine ailments; its cure was to be effected by an intrauterine pessary. This theory of the minor uterine ailments is well known to be now in a very shaky condition. Scarcely any one adheres to it. The treatment by intrauterine pessary is well known to be an exploded heresy, and to have been long almost, if not altogether, disused by Simpson himself. Winckel, Martin, Beatty, and some others, are still a forlorn hope struggling for its partial defence; but the attempt is futile. In spite of all this, which is well known, the original paper on this subject, by Simpson, in the *Dublin Medical Journal*, is here virtually reprinted with scarcely a note or comment! and the book is intended for the guidance of practitioners! Nothing is said of the fatal and other injurious consequences of a plan of treatment the description of which remains much as originally proposed, although it was subsequently given up by the proposer himself.

We must stop somewhere in this line of criticism, though we have plenty of materials for continuing it, lest we weary our readers by its undue extension; yet it is natural for a reviewer passing over the work of a great author to seize its salient points, and especially those which offer prominent obstacles to complacently smooth reading. The student will find much interesting matter in this volume of a more commonplace kind than what has excited our remarks; much, indeed, in a tame old-fashioned style, which we scarcely recognise as the work of this impetuous author. This kind of work is all of recent date.

The three volumes of Simpson's works which we have reviewed, constitute an admirable picture of the man, of his style of thinking, practising, and writing. They are the works of one who attracted as much notice and excited as much attention as any of his contemporaries. They ought to be in every medical library.

The West Riding Lunatic Asylum Medical Reports. Edited by J. Crichton Browne, M.D., F.R.S.E. London: 1871.

An Analysis of Post-mortem Appearances in 235 *Insane Persons.* By James C. Howden, M.D. Edin., Medical Superintendent of the Montrose Lunatic Asylum.

The West Riding Reports are a collection of thirteen essays on subjects connected with insanity. They are, of course, of unequal moment and of unequal merit; but, taken all in all, contain a good deal of interesting matter, the result of keen observation and painstaking research, discussed in a scientific spirit.

The first paper is on Cranial Injuries and Mental Diseases, by Dr J. Crichton Browne. It might fairly be conjectured that a knowledge of the physiology of the brain would be extremely useful in the prognosis of cerebral injuries, or that the careful observation of such injuries would tend to throw great light upon the physiology of the brain; but when we come to compare and try to group these cases, we find the results so variable and contradictory, that there is no gainsaying Dr Browne's observation, that "the subject is still involved in doubt and confusion."

We regard it as a perfectly open question whether the cerebrum is an organ with a common function, like the kidneys, or whether different functions or different kinds of mental work ought to be assigned to its different morphological parts. Dr Howden, in his analysis of the post-mortem appearances in 235 insane persons, writes—"In referring to the summary, I shall not pretend to prove any connexion between the lesion and the mental symptoms during life." But, then, what is the use of men taking toil and trouble to slice up brains by hundreds if no connexion can be established between the symptoms during life and the appearances after death? Dr Howden, of course, knows this very well; but his experience has as yet afforded him no certain guide to help him in connecting the one series of observations with the other.

Dr Browne sets himself to show how cranial injuries often are the cause of mental disorders; but, then, he has to admit the existence of a factor of very variable power in what we call hereditary or constitutional predisposition. This predisposition he holds is much greater in civilized than in barbarous peoples. Some savages in South America flatten the heads of their children in a monstrous manner by artificial pressure; but this, we are told, has no perceptible effect in diminishing the intellect of those who survive it. Then, again, Dr Browne cites authorities to prove that insanity is almost unknown among some tribes of the American Indians. Yet we may safely assume that cranial injuries are not uncommon among those savages; and thus, if the facts are correct, the greater predisposition of civilized man to become insane under injury to the nervous centres must be held to be proved. Dr Browne thinks that the greater size of the head of the male infant renders him more liable to injuries at birth than the female infant. "The diseases of the nervous system," observes Dr Farr, in the Registrar-General's Second Annual Report, "are twenty-three per cent. more fatal to males than to females, the chief difference arising from the diseases which affect children."

"Sir James Simpson," Dr Browne observes, "did not trace the pernicious effect of the greater compression of the male head at birth for more than a short period thereafter; but arguments might be adduced to prove that they may really extend over the whole of life, and either directly or through the instrumentality of convulsions, or some other intermediate disorder, eventuate in no immaterial propagation of mental aberration." Of course, Sir James Simpson would never have denied the *possibility* of such distant effects. As a general rule, we are disposed to think that if the child escapes in infancy, there is not sufficient proof that it is in much danger of suffering in later life.

We wish Dr Browne had attended more carefully to the relation between the head of the child and the size of the pelvis of the mother. He quotes the well-known observations of Broca and others to prove that the cranial capacity of some nations has increased since the Middle Ages. It would, however, not be easy to prove that women nowadays run more danger in childbirth. The mean internal capacity of the skull in Europeans is 92·3 cubic inches, in Asiatics 87·1; yet childbirth is often very difficult with Asiatics, at least in India, and insanity is not unfrequent. Dr E. Weber has advanced facts to show that there is a relation between the shape of the head in different races and the shape of the pelvis; and it is not safe to assume, as Dr Browne appears to do, that while the size of the head has increased with civilisation, that of the pelvis has remained the same.

Dr Browne gives a number of interesting examples of the bad effects of slight concussions and oscillations of the brain in producing insanity in those already predisposed to it. His essay is well written, and if some of his conclusions appear open to question, this may be set down to the extreme intricacy of the subject.

There is a good paper on the Ophthalmoscope in Mental and Cerebral Diseases, by Mr Charles Aldridge, L.R.C.P. The following quotation will indicate the interesting nature of his observations (p. 89):—“Schroeder van der Kolk has shown that in all (?) epileptics there is a dilated condition of the capillary bloodvessels and secondary granular” (and fatty) “degeneration of the medulla oblongata. This dilatation he regards as the proximate result of the fits, and not as their cause. He also states that with these changes vascular dilatation of the brain, and particularly in the cortical substance, goes hand in hand. The small ganglionic cells become compressed by the dilated vessels, and perhaps also in consequence of the more albuminous nature of the intercellular fluid. Dulness and loss of memory are the results; or if, after a fit, an unusual current of arterial blood is supplied, we have following immediately upon the paroxysm, over-irritation, rage, and acute mania, which is present in so many epileptics. How well does all this chime in with the conditions found in the retinal circulation both during the paroxysmal and the interparoxysmal periods! The general condition of the retinal circulation, as has been shown, being one of passive hyperæmia, there is accompanying this, and in relation with it, a state of dementia; the dementia being most profound where the dilatation of the veins is the greatest. Again, the remark as to the mania or excitement following immediately after the fit in many cases being due ‘to an unusual current of arterial blood’ supplied to the brain, brought to my mind—for I had not seen Van der Kolk's book until my observations were completed—the case of M. H., No. 4, the details of which have been given above. I there noted that during the stage of excitement immediately following the epileptic fit there was increased vascularity of the disc, and that the arteries had become larger; and I remarked upon the fact of this sudden restoration of the circulation being accompanied by excitement."

Dr Howden, in his pamphlet, observes—"Very marked injection of the membranes is often met with in patients maniacal, in the recent stages of general paresis, or after severe epileptic convulsions." "Hæmorrhagic effusions in the pia mater are not unfrequent in epileptics; those I have met with are of old standing, and had assumed the character of rusty gelatinous deposits."

A noticeable feature about most of these reports is the hopeful view which is taken of therapeutic agents in insanity. In the observations on the physical action of nitrous oxide, it is thought that this gas "may be with advantage employed in certain forms of mental disease;" and Mr George Thompson, L.R.C.P. London, remarks that the Calabar bean has been extensively used in the treatment of general paralysis in the West Riding Asylum, and that in every case its employment has been attended with marked benefit. Mr E. Churchill Fox, in a short paper on the Use of Ergot of Rye in the Treatment of Mental Diseases, remarks:—"I have seen it secure rapid recovery from that singular and obscure condition, the status epilepticus." He is inclined to think that with bromide of potassium the fits are reduced in number and severity, but the paroxysms of mental disturbance are intensified and prolonged. The conclusion which Mr Thompson arrives at, in his article on the "Sphygmograph in Lunatic Asylum Practice," may perhaps be questioned by those who are prepared to thank him for his observations. "General paralysis of the insane," he writes, "is a disease which may be presumed to be owing to a considerable extent to persistent spasm of the vessels, which leads to change in their component elements, but more especially in the muscular substance. This persistent spasm, by reducing the amount of blood which can pass through the vessels to the parts to be nourished, prevents renewal of these parts, and, consequently, [causes?] wasting. The most rational treatment indicated is to relieve this spasm." *Solus spasmus et simplex atonia*—there is nothing like the sphygmograph for clearing up difficult points in pathology.

In an article on "Phthisis and Insanity," Dr Clouston's views, that tuberculosis is a frequent cause of insanity, are ably criticised, and the statistics on which he relied opposed by other statistics. Certainly it would be difficult to convince one who has observed a large number of cases of phthisis, as they occur in ordinary practice, that this disease has any special connexion with insanity. A man labouring under consumption has some reason to feel unquiet in mind, and it often brings with it poverty and many other evils known to be exciting causes of insanity; yet, take it all in all, we suspect that phthisical patients are not more apt to become insane than might be expected from their proportion to the general population, and that the depressing influences of melancholy, exhaustion, or confinement are the real causes of the frequency of consumption in asylums.

On the Treatment of Fractures of the Limbs. By SAMPSON GAMGEE, Fellow of the Royal Society of Edinburgh; Surgeon to the Queen's Hospital, Birmingham. London: J. and A. Churchill: 1871.

THIS is, in many respects, a remarkable book. The author's name guarantees its cleverness, and assures us that we shall find in it strong individuality and originality of thought, expressed in bold but distinct language, unfettered by any trammels of reverence for tradition or false modesty.

The arrangement of the work, as the author himself points out, is fragmentary and irregular; there are many repetitions and redundancies, and the facts and deductions from them are not well systematized. We think the work would have been more effective had it been arranged as a treatise, and very much abridged.

The aim of the work is to introduce a very great and radical change in the principles guiding treatment of fractures of the limbs, which he believes, in this country, are usually treated on a wrong principle. Mr Gamgee enunciates three chief rules:—1. That the fracture should be *instantly* reduced; 2. That the limb should be subjected to instant and thorough *circular compression;* 3. That the fracture should be thoroughly, not partially, *immobilized.*

As to the first of these principles, he will find no surgical authority of any eminence to dispute the point. As to the third, we are all *theoretically* at one; but we quite agree with Mr Gamgee that, practically, many surgeons are most unsuccessful in obtaining—most are most careless in attempting—really to immobilize a fracture. We most thoroughly agree in every word he says as to the unsatisfactory nature of the retentive power of a Macintyre splint, and of most of the usual bandages and splints for broken humerus or broken femur. All his observations on these two heads are most admirable and sensible. In Syme's words—"the great requisites for treating fractures successfully are coaptation and immobility."

As we find that, as to two-thirds of his principles of treatment, Mr Gamgee is really at one with the great bulk of surgical authority, we with some difficulty understand the numerous allusions in various parts of the work to the radical differences between his method and that of his teachers and contemporaries, as these differences are really reduced to very narrow compass. He tells us—"I have been in the habit of treating the subject somewhat dogmatically, strong in the correctness of the principles to which I adhere, as opposed to those held by the vast majority of surgeons."—P. 5. "The numerous splints and contrivances recommended for different fractures of the upper and lower extremity are evidence of an imperfect understanding of the subject, and must eventually give way before a philosophical appreciation of its fundamental principles, and a correct estimate of their practical application."—P. 70. "The yoke of authority in science is so enslaving and so fatally inimical to progress, that on no condition could I myself support it, or counsel its being borne, however eminent might be the intellect which sought to impose it."—P. 144. Surely such a principle ought to prevent Mr Gamgee from promulgating, on his own *authority*, his new doctrines. Surely, if carried out to the full, we ought all to begin *de novo*, as if nothing had been written, nothing sifted by long labour and experience—as if, indeed, no science of medicine existed at all. Again, is there not a *naïveté* almost approaching innocence in this remark?—"It is curious how some of the best authorities, old and recent, agree in condemning what is right."—Footnote to p. 146. A most enviable frame this, that is so certain as to what *is right* in spite of the best authorities.

Let us now see what this second proposition really means that is so much against the best authorities. It is the principle of circular compression, which, at page 83, is described as "The gentle and perfectly uniform, the evenly distributed, and in no way constricting action, which I understand by compression as applied in the treatment of fractures, is a therapeutic agent than which I know none more demonstrably beneficial." We agree with every word of this. It is an admirable description of what a well-applied bandage and splint ought to be. Mr Gamgee differs from many surgeons in the boldness with which he applies them at once, while most surgeons wait for a day or two, or even more. We believe that, in principle, he is right, and those who wait are wrong; but in practice, and in the hands of the great majority of ordinary surgeons, we believe that Mr Gamgee's plan would be dangerous, and the ordinary one more safe. With skill and care—with the practice which none but hospital surgeons can acquire—and, still more important, with a house-surgeon constantly at hand—we believe Mr Gamgee's plan of immediate compression to be simple, pleasant, safe, and effectual; but, in the hands of the great majority of surgeons, and still more, in cases treated at their houses, and seen perhaps once a day or once in two days, Mr Gamgee's plan has risks both to limb and life.

He supports his arguments by the recital of some most excellent cases, the headings of one or two of which we quote to show their nature. "CASE 12. Fracture of both bones of the leg, with eversion, great swelling, and blebs. Application of starched apparatus. Rapid subsidence of swelling. Patient able to lift leg the fourth day; out of bed the ninth. Uninterrupted recovery. CASE 14. Compound and comminuted fracture of the leg from direct violence; great shortening—violent spasm. Immediate application of starched apparatus; able to get up on the eleventh day. Perfect union without any shortening, and very slight thickening."

A well-written, but rather exaggerated, contrast is drawn in the sixth lecture between a case treated by leeches, fomentations, and utterly inefficient splints, and another treated on his own plan, much to the advantage of the latter. It also includes a very interesting note on Vanzetti's treatment of inflammation by digital compression.

The remainder of the book contains practical directions as to the making and applying his splints, which any who intends to practise his method would do well to peruse.

A most ingenious pillow, devised by the author, on the basis of an idea of Mr John Grantham's, is thus described :—" My fracture pillow is of indiarubber, and is divided longitudinally into three compartments, of which the middle one is filled with water, and the two lateral ones with fine sand. A strip of thin board, with straps under the water compartment, admits of the lateral sand partitions being brought close round the limb, and the whole being suspended to an ordinary swing cradle. The elasticity of the central water compartment is a source of great comfort, and the long lateral sand-bags give very efficient support."

In conclusion, we would advise all surgeons to read this suggestive and interesting work, though we believe that the enthusiasm of a partisan may have to be toned down by the results of experience.

On the Treatment of Hyperpyrexia, as illustrated in Acute Articular Rheumatism, by means of the External Application of Cold. By WILSON FOX, M.D., F.R.C.P., etc. London and New York: M'Millan and Co.: 1871. Pp. 78.

IT seems to be an unfailing consequence of all advances in physical diagnosis, that they lead primarily to an over-valuation, from a therapeutic point of view, of the means by which they are attained; so it was with the stethoscope in times not long past, and so it seems now likely to be with the thermometer. The revelations of the stethoscope led to the assumption that the essential part of the disease consisted in the physical alteration of the parts affected; and the therapeutic abuse to which this gave rise, was the extension of a treatment adapted for certain well-known symptoms to all cases presenting the physical signs usually associated with such symptoms, quite apart from the actual presence of these symptoms. The result of this, as might easily have been foreseen, was a questioning of the utility of the therapeutic means employed, and an ultimate discarding of them—perhaps too completely. The revived use of the thermometer in disease seems likely to lead to somewhat similar results—an over-valuation of mere temperature as a therapeutic indication, and possibly an ultimate discarding of useful remedies, because pushed to extremes by over-zealous advocates.

We freely acknowledge the great advantage to diagnosis, prognosis, and therapeutics which result from a judicious use of the thermometer, and a rational estimate of its indications as one of a series of valuable symptoms, but we demur to the tendency of the present age to regard temperature *per se* as the most important object of treatment, to the means most commonly advocated for this treatment, and to the reasoning adduced in support of the success of this treatment.

There is no doubt a degree of temperature necessarily fatal under all circumstances, just as there is an amount of consolidation of the lung also fatal under all circumstances; but just as we have lower degrees of consolidation proving fatal under certain circumstances, so we have also lower degrees of temperature which prove fatal—or at least accompany mortality—in certain conditions. But there is no reason to conclude that in these lower degrees it is the temperature *per se* which is fatal; it is only one of many phenomena which constitute the disease; it is really only a symptom—nay, only a consequence—of those phenomena which produce the fatal ending, and which may go on increasing, as in cholera, after that result has been attained. It is obvious that death, occurring with a temperature short of one absolutely and necessarily fatal, is not the result of the temperature *per se*, but depends upon other concomitant circumstances, the influences and effects of which must be duly considered in regard to the treatment to be employed with most hope of success; and it is also obvious that, under these circumstances, any treatment solely directed towards a reduction of temperature proceeds upon limited and imperfect views of the nature of disease, and if successful is only so because it has not interfered injuriously with the natural tendency to recovery. Now, if Dr Fox has found (p. 27) that the temperature of 106°, and Dr Murchison that of 106°·5, is uniformly fatal in rheumatism, while other observers have seen recoveries in other diseases, such as sunstroke, relapsing or scarlet fevers, subsequent to a much higher corporeal temperature—say 108° or 109°—it is self-evident that temperature in itself has not been the cause of death in these cases of rheumatism, and that treatment directed solely to the diminution of temperature has not proved successful because of its paramount utility, but only because, while possibly aiding in recovery, it certainly opposed no obstacle to that desired end. But even supposing the reduction of the corporeal temperature to be a paramount therapeutic necessity, it is surely a most unscientific procedure to treat the living body as we would a hot poker, and simply plunge it into cold water. We state only well-known physiological facts when we say that exposure to a minor degree of cold induces reaction and increased heat in the living body, while exposure to a severer degree of cold, if not followed by reaction, is uniformly fatal; and if this be the case in health, how much more likely is it to be the case in disease, when general vitality, as comprised in nervous reaction, is not inconsiderably lowered. Indeed, even in sunstroke, which is accepted by Dr Fox as the analogue of hyperpyrexia from internal causes, it is not so much the direct cooling of the douche that is of importance, as the reaction consequent on its use; for if the skin refuse to act after the douche, the high temperature is maintained and the patient's danger persists. But if the skin acts or perspires, it certainly does not do so simply because it is cooled down, but because, by intermittent douching with cold water, nervous reaction is roused, and surface circulation and secretion restored. In *asphyxia neonatorum*, which is somewhat analogous, pathologically, inasmuch as it consists in pulmonary congestion with nervous depression, but where there is no excess of heat internally or externally present, it is necessary to supply this artificially to insure the complete success of the cold douche in rousing the little patient to vitality; a very inconsiderable prolongation of cold would be sufficient for ever to prevent this revival, but by the alternate application of hot and cold water, nervous reaction is exhibited in increased cutaneous circulation, proved by the turgor and redness of the skin, and firmness of the limbs, which are felt and seen long before vitality is sufficiently restored to be evinced by a cry. Numbers of new-born children have died from sudden or prolonged immersion in cold water; and Mauriceau, in his treatise on Obstetrics, says that infants have even died merely from baptism in cold water; yet cold, properly applied so as to insure reaction, has proved one of the most powerful means of rescuing even infants from a dangerous state of asphyxia. During the Russian campaign, soldiers were known to expire suddenly, as if thunderstruck, from excessive cold; and at Smolensko more than thirty grenadiers thus fell dead when attempting to set themselves in a line on a height beyond the Borysthenes (Beaupré). Cold, in producing stupefaction, acts, as Prosper Alpinus says, exactly as narcotics do; that is, it produces internal congestions, chiefly of the brain and lungs, with coma and asphyxia. Of course, in the treatment of disease, no one would think of pushing cold to such extremes; but when the nervous reactions are weakened by the exhaustion of disease and defective nutrition, as well as numbed by poisonous blood, a very much lower degree of cold applied externally will suffice to produce dangerous symptoms, and to attempt to treat the living body as we would a hot poker, seems to court their advent. A prolonged cold bath will effectually kill a healthy man—how much more speedily may it not kill a sick man? All physiology teaches us that the mere abstraction of heat is not only insufficient to restore a sick man to health, but rather the reverse, unless the cold be so applied as to insure vital reaction and an improvement in all the secretions. This, however, seems hardly to be the tendency of modern teaching, which, so far as we can understand it, seems to be that it is only necessary to cool the body down to a certain degree, and avoid if possible any reaction. It can only be by chance that any such procedure is ever successful. It is many a day since Lancisi wrote—"Nullum optimum ad curandos ab epidemicis febribus inventum esse remedium ipso nivis usu;" since then many authors have treated of this subject. Much may be learned from the works of Currie, Robert Jackson, Beaupré, etc., and it would be well perhaps to reconsider the whole subject from an eclectic point of view. The tendency of Dr Fox's reasoning is to show the paramount importance of the abstraction of heat from hyperpyrexial patients, but the tendency of his carefully-observed facts seems rather to confirm the importance of a judicious employment of cold in the rousing of the fast-failing nervous reactions; the return of free perspiration, and the reappearance of the rheumatic joint affections being, in his opinion, the most favourable symptoms—symptoms which, we need hardly say, cannot be regarded as simply the result of chilling the surface of the body, or lowering the general corporeal temperature. Our remarks, therefore, have been more directed against an over-zealous pushing of Dr Fox's views rather than against his own cases, which form a most remarkable contribution to the science of therapeutics, and are well worthy of careful study. What effect, if any, the large doses of quinine and the very considerable doses of brandy (20 to 30 oz. in twenty-four hours) administered had upon the course of the disease, and how this powerful stimulation acted, is also deserving of the most careful consideration in any attempt to estimate at its true worth the treatment employed, and to assign to each of its elements its proper value.

Psychic Force and Modern Spiritualism: A Reply to the Quarterly Review and other Critics. By WILLIAM CROOKES, F.R.S., etc. London: Longmans, Green, and Co.: 1872. Pp. 24.

IN this pamphlet Mr Crookes attempts to combat his reviewers. It is not worth while to follow his arguments. In his preface he states that he wishes for the present "to be considered in the position of an electrician at Valentia, examining, by means of appropriate testing instruments, certain electrical currents and pulsations passing through the electric cable, independently of their causation, and ignoring whether these phenomena are produced by imperfections in the testing instruments themselves — whether by earth currents or by faults in the insulation — or whether they are produced by an intelligent operator at the other end of the line."

At p. 474 of the *Quarterly Journal of Science* for October 1871, Mr Crookes says:—"Before fitting up special apparatus for these experiments, I had seen, on five separate occasions, objects varying in weight from 25 to 100 lbs., temporarily influenced in such a manner, that I and others present could with difficulty lift them from the floor. Wishing to ascertain whether this was a physical fact, or merely due to a variation in the power of our own strength under the influence of imagination, I tested with a weighing machine the phenomenon on two subsequent occasions when I had an opportunity of meeting Mr Home at the house of a friend. On the first occasion, the increase of weight was from 8 lbs. normally, to 36 lbs., 48 lbs., and 46 lbs. in three successive experiments tried under strict scrutiny. On the second occasion, tried about a fortnight after, in the presence of other observers, I found the increase of weight to be from 8 lbs. to 23 lbs., 43 lbs. and 27 lbs. in three successive trials, varying the conditions." We venture to think that these experiments thus detailed will leave no doubt in the mind of any party of average intelligence as to the existence of an "intelligent operator at the end of the line," though they may create great wonderment why so intelligent an operator should content himself with mystifying Mr Crookes, Lord Lindsay, etc., and not rather at once realize a fortune by a judicious employment of his peculiar art in the ordinary course of trade. We concede to Mr Crookes all honesty of purpose; but we need hardly say, that we deem him deficient in the only psychic force whose existence we acknowledge—the force of intellect.

Scheme for obtaining a better Knowledge of the Endemic Skin Diseases of India. Prepared by TILBURY FOX, M.D. Lond., F.R.C.P., etc.; and T. FARQUHAR, M.D., Surgeon-Major, H.M.S. Bengal Medical Service (retired). 1872.

THE object of this document is to collect information relative to certain diseases specially prevalent in, or peculiar to, India. The document, which goes to India by next mail for general distribution, has been prepared by Dr Tilbury Fox, with the assistance of Dr Farquhar; the former is the physician to the department for diseases of the skin at University College, London; the latter lately held an important medical appointment in India.

The first section of the paper gives particulars as to the means by which it is suggested the desired information should be obtained, and the diseases to which reference is made.

Two main objects are proposed:—

1. To obtain and then to circulate a better knowledge of the more important endemic skin diseases of India, or such as principally attack the skin; and thereby

2. To bring about an agreement, which is far from existing at present, between the profession in India and in England as to the nomenclature, the typical character, the varieties, and the probable or demonstrated causes of the diseases in question.

At present very considerable confusion arises from the want of an agreement as to the use to which particular terms should be put—elephantiasis, for example—the same disorder being spoken of by different persons under different names, and *vice versâ*. The prevention of such confusion would itself be a great gain to science, as it would enable observers to conduct investigations relative to diseases with infinitely less labour, and unquestionably with greater certainty of obtaining reliable data.

One special though indirect result of the inquiry would be, that those who were training in this country for medical service in India would be enabled to acquire with no little readiness a satisfactory knowledge of a certain class of diseases of the commonest occurrence in India, the components of which class they would have at once to treat on their arrival in that country, and of which no great amount of clinical experience can be obtained in England. Further, the inquiry would be of great use to the English, and indeed the Continental practitioner, in furnishing him with valuable guides for the more speedy recognition and the better treatment of the numerous cases of peculiar skin diseases that are imported into this country and elsewhere from India, a locality that abounds in material for scientific investigation as regards the influence of climate, etc., upon cutaneous disease.

It is also believed that the inquiry may tend to show not only what are the special diseases due directly to special climatic influences, but also the character and extent of variations in the same disease induced by differences of climate: for the same disease does undoubtedly vary in its characters in different countries.

The mode in which it is believed the objects above stated may be easily secured is by seeking the assistance of the scattered and able medical officers of India in the collection of facts, and by utilizing and unifying the experience and opinions of these gentlemen.

The details of the scheme are so arranged as to remove, it is believed, some of the special difficulties under which the Indian medical officer labours in the prosecution of careful investigations into the nature and causes of disease in India; though in the face of very special obstacles it is surprising how good is the work done by Indian observers from time to time. Reference is specially made to the few opportunities afforded Indian medical officers of consulting libraries, of obtaining access to the multifarious periodical publications in which are recorded the most recent researches of European pathologists, the difficulty of carrying about with them the necessary apparatus for minute and experimental inquiry, and the like.

The difficulties referred to will be in great measure lessened by giving a resumé of the latest researches and the opinions of European dermatologists relative to the various diseases to which it is thought desirable to direct attention, and by indicating the points of doubt which require to be cleared up, and the line of investigation which should be pursued in the future, for the further elucidation of the nature and causes of particular diseases.

By indicating the several points upon which information is specially needed, not only will the main objects of the inquiry be promoted, but the time and labour of Indian medical officers will be greatly economized.

The endemic skin diseases of India deserve to be studied for themselves for several reasons. They are a great source of distress to sufferers from their attacks. They are the indications in many cases of morbid action, affecting the body profoundly and arising from preventible causes, and when closely studied they afford valuable information as to the causation of disease. They crucially test the action of remedies, whilst a more correct and a wider knowledge of their causation will greatly tend to increase the confidence of man, be he European or native, in the power of hygiene and medicine to relieve suffering. It is not at all unlikely, moreover, from concentration of attention to this, till recently, but slightly cultivated branch of medical science, important facts may be gained as to the nature and action of remedies which are successfully employed by European and native medical men in India, but with which we are unacquainted in this country. Some of these remedies are frequently mixed up with inert or dangerously active substances which compose the lengthy prescriptions of the hakeem, in such a way as to render it a matter of difficulty to determine what the active powers of these medicines individually are. Already something has been done to define them by medical officers in India, who would be glad to see them attract the attention of the therapeutic student in Europe. Many good drugs have still to be recognised, and they are considered too valuable to be disclosed by the native practitioner. With the progress of education, however, it is to be hoped the prejudices that lead to secrecy will be overcome, and the real or pretended powers of many undisclosed remedies be fully understood.

The scheme is to give, under the head of particular diseases, a brief statement of the views of the leading European dermatologists as to the nature of these diseases, to indicate doubtful points and the chief questions to be now determined in regard to them, and to ask for answers to precise questions.

The following heads indicate the kind and extent of information sought:—

a. The accurate observation of cases, especially with reference to the exact mode of origin of disease.

b. The microscopic characters of morbid products.

c. Precise information, inasmuch as climatic influences have much to do with the genesis of disease in India, touching the name and character of particular localities in which particular diseases prevail, with exact statements as to the nature and alliances of those diseases. [Situated as medical men are in India, in such varying climates and among such different races acted upon by such a variety of circumstances as to food and clothing, etc., they might gather valuable information about the geography of diseases of the skin. It is notorious that sharp lines seem to cut some diseases off from different parts of the country. This is the case as regards severe forms of itch, leprosy, Madura foot, Delhi sores, etc.]

d. The nature and peculiarities of the food and water supply of the affected population.

e. The tribes or castes in which particular diseases occur, and the habits of these tribes, ex. migratory or otherwise. [The influence of certain religious practices, such as that of covering the body with ashes and other earths, as followed by fakeers and religious medicants, deserves notice.]

f. The occupation of the attacked.

g. The dress of the attacked, especially with regard to the exposed or unexposed nature of the seats of disease. [It is an interesting question, for example, to determine whether the diseases of the scalp are more frequently developed in races that cut short their hair and shave their head, or among those who keep their hair long. Many of the Hindoos shave all or the most of their scalp, head, arm-pits, etc. The Mahommedans, as the rule, cut the hair close. The whole Seikh race never allows a razor or scissors to touch a hair. Many millions of Indians go about bareheaded; others wear only skull-caps; others wear great masses of cloth like tablecloths on their heads. The influence of these practices on disease it is important to know.]

h. The observed differences between disease as seen in the darker races of the East and in Europeans, and the differences in the same disease as observed in India and in Europe.

i. The connexion between season and disease. [Where the variety of climate is so great as in India, the observation of this point might lead to important results.]

The following are the diseases to which it is thought desirable that attention should be directed :—

1. Morphœa. 2. Scleroderma. 3. Frambœsia. 4. Delhi sore. 5. Keloid. 6. Fibroma. 7. The Elephant leg, or Elephantiasis Arabum, or tropical big leg. 8. The Fungus foot of India, or Madura foot. 9. The true Leprosy, or Elephantiasis Græcorum. 10. Leucoderma. 11. Pityriasis vesicolor in unusual forms. 12. Burmese ringworm. 13. Malabar itch. 14. Lichen tropicus, or prickly heat.

N.B.—The information which is particularly asked for, is essentially such as is precise. Mere general statements or replies to questions of a wide and general character are specially undesired. Special forms for note-taking and for tabulating cases are given with the accounts of certain of the diseases.

When sufficient data have been collected, a special summary report will be made on the whole subject. Each observer will have full credit given him for any contribution he may furnish towards the report.

Morbid specimens properly preserved, if sent home, would be thoroughly investigated and the results embodied in any report made. Representations of diseases in the way of photographs, sketches, and coloured drawings, will be very useful.

The Skim-Milk Treatment of Diabetes and Bright's Disease; with Clinical Observations on the Symptoms and Pathology of these Affections. By ARTHUR SCOTT DONKIN, M.D. Edin., M.D. Durh., Lecturer in Medical Jurisprudence in the University of Durham, etc. London: Longmans, Green, and Co.: 1871. Pp. 317.

✓ THERE are no questions of more importance to the practitioner than those connected with the treatment of diabetes and of Bright's disease, both of them most interesting, important, and unfortunately too common diseases. In estimating the value of the present work from a practical point of view, we must first separate Dr Donkin's pathological from his practical researches, and next endeavour to ascertain the value of the latter. In the pathology of diabetes, Dr Donkin has not advanced beyond Pavy, and he ignores the researches of Flint, Lusk, and others, which have tolerably conclusively proved the glycogenic function of the liver to be a fact. Here, therefore, he is behind the age; not only has he not added anything to our knowledge of the causation of diabetes, but he is even ignorant of our present standpoint in regard to its connexion with the liver. The same may be said in regard to the mode in which the glycogenic function of the liver is affected by the nervous system; here he has not got beyond Dickenson, whose views he controverts, while he is wholly ignorant of the researches of Cyon and Aladoff, on the influence of the vagus in the production of sugar. No mention is even made of Cantani's views as to the elimination of sugar being the result of diminished combustion, though that is intimately connected with any rational theory of his own method of treatment. The essence of the pathology of diabetes seems, in the present day, to resolve itself into two questions: 1*st*, How far the appearance of sugar in the urine is the result of imperfect combustion or combustibility of the glycogen formed in the liver? 2*d*, How far this glycosuria is the result of simple increase of the glycogenic function—an increase which may be brought about in two ways, viz., by alterations in nervous action produced reflexly by derangements of other organs, or by organic disease of certain parts of the nervous system itself. All these causes we believe to be in action in different cases, and essentially to influence their curability; but Dr Donkin has not only not endeavoured to ascertain their relative importance, but he seems entirely ignorant of their existence.

Dr Donkin seems also to take for granted that our present tests for sugar in the urine are all that could be wished, yet any considerable clinical experience would have taught him that this is far from being the case, that density varies even more with diet than with amount of sugar, and that all the tests—except perhaps those by polarization or fermentation, of which we ourselves have no accurate experience—are so fraught with fallacies as to be utterly unreliable in the ascertaining the presence of small, yet clinically important, quantities of sugar.

In estimating the value of Dr Donkin's work, we must therefore restrict ourselves entirely to his cases; and here we are met by the remarkable facts that, during a period of more than two years, Dr Donkin has only met with seven cases of diabetes whose results he cares to record, in not one of which has the patient been restored to such a state of health as to be able to return to ordinary mixed diet containing starch, while three of these cases proved fatal, and a fourth gave up the treatment, the result being unknown. Of these seven cases, therefore, collected—and we must surely suppose selected, for diabetes is no uncommon disease—only three have attained a modicum of health consistent with a diet from which starch is still rigorously excluded. This we conceive is no result to boast of, and the attainment of which does not demand any such exuberant flourish of trumpets as is represented by the publication of a work of upwards of 300 pages.

The therapeutic employment of milk in disease generally is a matter dating from the days of Hippocrates, and which has been comparatively recently elucidated in our own pages, in an admirable paper by Dr Karell of St Petersburg (August 1866). While its special application to the treatment of diabetes has been recommended by Dr Headland since 1859, and insisted on by Dr Smart in 1863, the only absolute novelty in Dr Donkin's views consists in his absolute exclusion of fatty matters from the diet—in the rigid employment of skim-milk. Fatty matters have not hitherto been considered as deleterious in the treatment of diabetes, but, on the contrary, have generally been recommended—our own experience, so far, leads us to confirm Dr Donkin's views, and to regard fatty matters and eggs as both likely to be injurious; but this, as yet, is a mere plausible conjecture, and is not founded on any certain basis.

Even the very meagre statistics of Dr Donkin leave us in no doubt as to the value of the skim-milk treatment of diabetes; they show us clearly enough that it is not sufficient for a perfect cure, though the diet, from its nature, cheapness, and ready procurability, is in many cases an admirable means of keeping the disease in abeyance. On the other hand, it is a diet difficult to inaugurate in such ticklish customers as diabetic patients, and, from its insipidity, mawkishness, and want of solidity, it is difficult to continue for any length of time. It is certainly not a cure, as Dr Donkin's cases themselves prove; for poor people of firm minds who value life for its own sake, it affords the only diet they are likely to be able to obtain by which life and a certain amount of usefulness may be maintained; but for those who are better off, there is no need to lead them through the risks of an apprenticeship to a milk diet, afterwards to be combined with animal food and green vegetables, when the same benefits can be obtained without the risks by commencing at once with this diet mixed as to quality and only restricted as to starch, which very few diabetics indeed can ever be brought to ingest with impunity.

In regard to the treatment of Bright's disease by skim-milk, Dr Donkin is inclined to restrict its utility solely to inflammatory cases; but these are precisely the cases in which similar symptoms are so often associated with very different pathological lesions. A simple catarrh of the tubules, even of some standing, is a very different pathological disease from a large white kidney; yet the symptoms may be identical; the one may be recovered from, the other never is,—the mere administration of milk is a matter of slight moment in the history of the case. A restricted diet is no doubt useful in warding off uræmic complications in all cases—it can only promote a cure when the disease is purely catarrhal or restricted to a limited portion of the kidney; but a restricted diet may be accomplished by other means more pleasing and more safe to the patient than by confinement to skim-milk. While not denying, therefore, the usefulness of skim-milk in some such cases, we may safely enough object to the dogmatism which would propound it as in itself curative on the strength of only five cases, one of which was fatal.

Recollections of Past Life. By Sir HENRY HOLLAND, Bart., M.D., F.R.S., D.C.L., etc. London: Longmans, Green, and Co.: 1872. Pp. 346.

SIR HENRY HOLLAND has been a man singularly fortunate in his life. Blessed with a remarkable equanimity and moderation of mind, his early introduction into that elevated society amid which he has ever since continued to move, rapidly enabled him to attain the extreme of his worldly ambition as to wealth, while his extensive and well-grounded erudition enabled him to profit in a desultory sort of way by the conversation of the various remarkable and distinguished personages into whose company he was temporarily thrown, as well as by the remarkable cosmical phenomena with which he was brought into contact in the course of his annual travels. The result of this is this extremely interesting volume, embodying the recollections of a life now in its eighty-fourth year, and spent amid the most remarkable personages, scenes, and events of that period which comprises certainly the most extraordinary historical phantasmagoria ever exhibited to mankind, in the rise and fall of Napoleon I., and all involved in that as well as in the lamentable episode of the early history of Queen Caroline as Princess of Wales. Apart from the scientific history of this period, which in itself is of no mean value, its social history involves the consideration of problems which can never fail to interest mankind, and, as revealed by one so much behind the scenes as a fashionable, trusted, and, clear-headed physician, must possess an importance which cannot fail to ensure a widespread and intelligent auditory. We shall not spoil the interest of this work by imperfect quotations; it must be read to be enjoyed, or even understood; and we cordially recommend it to our readers as alike interesting and enjoyable.

A Treatise on Hæmophilia, sometimes called the Hereditary Hæmorrhagic Diathesis. By J. WICKHAM LEGG, M.D., etc. London: H. K. Lewis: 1872. Pp. 158.

DR WICKHAM LEGG is already favourably known as an accurate and trustworthy observer of medical facts, and this little work will certainly add to his professional reputation. The disease he treats of is one concerning which not much is known reliably, and we cannot indeed say that Dr Legg has added much to our knowledge of the subject; but in presenting us with an analysis and epitome of 163 authors who have written on the subject, he has deserved well of the profession, and has laid a foundation upon which himself or others may hereafter securely build. As yet, however, we have obtained no clear idea of what this disease is, nor whether it is essentially a disease or only a symptom, and the proper treatment is, as we may conceive, still a desideratum. Apart, however, from all practical value which it does not possess, this little work has a literary value which can scarcely be overestimated, and Dr Legg deserves all credit for the labour he has bestowed on the production of a monograph which hereafter will constitute the chief repertorium of facts connected with this disease, which is not more interesting than obscure, and whose very name is a riddle—for what is the signification of hæmophilia? And whence is its latter half derived? Φιλία is said to be the derivation, but it seems so senseless and absurd, that we hope etymologists may succeed in discovering some more intelligible origin for it.

Part Third.

MEETINGS OF SOCIETIES.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXI.—MEETING IV.

Wednesday, 10*th January* 1872.—Professor SIMPSON, *Vice-President*, in the Chair.

I. NEW CAUSE OF HÆMORRHAGE FROM PLACENTA.—*Dr Sidey* exhibited a placenta, and stated he had lately attended a patient in labour, and that at the termination of the first stage a considerable discharge of blood occurred of a dark character, with stringy clots. On examining the placenta afterwards, he found that the hæmorrhage had been caused by the separation of the membranes from the surface of the placenta, as indicated by a flattened clot below the membranes. The placenta seemed to have become hypertrophied round its circumference, its edges being thickened and extended about two inches beyond the circular sinus, with the membranes adhering to it, except where the clot was situated. He had shown it in its fresh state to Professor Simpson and Dr Keiller, who were astonished at the ease with which they could remove the membranes from the hypertrophied portion of placenta, and thought that the hæmorrhage had been thus produced during labour.

II. *Dr Andrew* exhibited a FŒTUS which had evidently remained *in utero* for three months after its death. Mrs M., æt. 33, had one child seven years ago. She married her present husband in September 1870, and menstruated regularly till the last week of February 1871. She felt life in the beginning of July; went on most satisfactorily till the end of August, when all movement of the child ceased, and instead of increasing in size she gradually got smaller. Her health, however, was unimpaired, her appetite continued good, and she slept well. She went into labour on 3d December, and was shortly delivered of this fœtus. She made an excellent recovery, and was soon going about her usual duties.

Professor Simpson thought the case very interesting from the long time the fœtus had been retained after its death. The death of the fœtus was probably owing to the coiling of the cord round the right thigh. He noticed that the cord was so tightly coiled round the thigh that there was a deep indentation in it.

SESSION XXXI.—MEETING V.

Wednesday, 24*th January* 1872.—Dr THOMSON, *President*, in the Chair.

Dr William Johnston, Stirling, and Dr Francis Moinet, 30 Melville Street, were admitted as Ordinary Fellows of the Society.

I. *Professor Simpson* showed a PLACENTA sent to him by Dr Groves. There was a peculiar ring within its border, and a considerable collection of serum between the amnion and chorion; one of the lobules of the placenta was detached, being only joined to the general mass by a tag of membrane. The placenta was in a state of fatty degeneration. The child had died during parturition, probably from partial separation of the placenta.

II. *Dr Croom* read a paper entitled, A CASE OF SYNCOPE DURING LABOUR.

Dr Keiller said the difficulty was to keep your patient in the horizontal position. He corroborated Dr Croom's remarks as to the weakened state of the auxiliary powers, and advised the early use of the forceps. He had given chloroform in such cases without any bad effects.

Professor Simpson remarked that the case would have been more complete if a post-mortem examination had been obtained. In persons of a rheumatic constitution the blood has a tendency to coagulate, clots would be apt to form in the veins of the pelvis, and, being caught in the small arteries of the lungs, would cause lobular pneumonia. He mentioned a case in which pneumonia occurred a month before labour, and where there was great distress during the pains from dyspnœa. He agreed with Dr Keiller in giving chloroform in simple valvular disease, but in dilatation of the right side or fatty heart, he considered it contraindicated.

III. *Dr Keiller* read a paper on THE MERITS AND DEMERITS OF THE RECENT TRIAL FOR MALPRACTICE AT STOCKTON-ON-TEES, and proceeded to give extracts from the printed evidence bearing upon the obstetrical points; the principal point being whether the uterus was or was not properly reduced. With reference to the infrequency of inversion, he stated that the late Professor Simpson had never seen a case of acute inversion. He proceeded to mention a case that had occurred in the practice of Dr Dumbreck, where he reduced an inversion the day after its occurrence, the patient being put under chloroform; also another case of acute inversion which took him upwards of an hour to replace.

Part Fourth.

PERISCOPE.

ON THE DIAGNOSIS OF SYPHILIS FROM THE MICROSCOPIC EXAMINATION OF THE BLOOD.—At the meeting of the Vienna Medical Society, on the 12th January 1872, Dr Lostorfer brought forward an entirely novel view in regard to this important subject. He stated that for the last four months he had pursued his investigations in this respect chiefly on material furnished by the clinique of Professor Zeissl, and that the result had been that he had found that the blood of syphilitic individuals, within a period of three or four days, constantly exhibited shining corpuscles, which propagated themselves by gemmation. The addition of a solution of sugar, or of Pasteur's fluid, caused these bodies to shrivel up, and they were afterwards found surrounded by vacuolæ. Professors Stricker and Hebra had repeatedly tested the correctness of his views by subjecting to his examination blood drawn from different subjects, and he had invariably detected those affected with syphilis. The syphilitic bodies in the field of the microscope often amounted to so many as fifty at a time, but were often less numerous. For their development twenty-four hours at least, more usually three to five days, were required, and a temperature of from 46°·4 to 50° Fah., while a lower temperature prevented their development.—*Berliner Klinische Wochenschrift*, 1872, No. 5.

[More recently Wedl has affirmed that this so-called discovery is a myth, but the names of Stricker and Hebra are a sufficient guarantee that it is not quite so utterly baseless, and its importance in regard to the diagnosis and mode of extension of syphilis is sufficient to excite the greatest interest in the solution of this important matter.—ED. *E. M. J.*]

APOMORPHIA.—It is now some years since this important emetic was brought under the notice of the profession here, yet no report has as yet been made as to its efficacy. Now that it has received the approbation of foreign physicians, we may hope to hear something more of its utility. Siebert, Riegel, and Böhme have ascertained, by numerous experiments on man and animals, that it is an effectual and rapid emetic, acting, according to Böhme, in from four to sixteen minutes, leaving behind it no unpleasant effects, and possessing the important quality that it can be effectually introduced by subcutaneous injection, a matter of great importance in children, and insane and comatose patients. The unpleasant effects occasionally observed have been only giddiness, cerebral oppression, tendency to yawn, and precordial anxiety; and even these disappeared so soon as vomiting occurred, and were always of short duration. No disagreeable results on the digestive organs were ever observed, and the place of injection was never found to suppurate. The physiological effects on the pulse, temperature, and blood-pressure have been thoroughly investigated by Siebert, and were never found to be of any important practical significance. Siebert found that the quantity necessary to produce emesis, when hypodermically injected in man, was only six or seven milligrammes (0·0925 to 0·108 gr.); and according to Riegel and Böhme the required amount varied from 0·462 to 0·154 gr. The latter employed a solution containing 1 per cent. The observers concur in stating that the most reliable preparation is that supplied by Macfarlan and Co., North Bridge, Edinburgh, under the name of the Hydrochlorate of Apomorphia.—*Berliner Klinische Wochenschrift*, No. 5, 1872.

ABSORPTION OF INSOLUBLE MATTER.—The *Philadelphia Medical Times* publishes an abstract, by Dr Louis A. Duhring, of a series of experiments made by Dr Auspitz, of Vienna, on the absorption of insoluble matter in mammals. The following are the conclusions arrived at:—1. That, in mammals, insoluble matter (starch-flour granules), starting from the peritonæum and subcutaneous tissue, is able to reach the lungs, and through these organs to enter the general circulation. 2. That these granules, in order to go over into the veins, pass through the lymphatic system. (That they are taken up exclusively in this way is not as yet proved.) 3. That the epidermis always presents a considerable, though only relative and not absolute, obstruction to the absorption from the integumentary surface. 4. That the absorption is essentially promoted by the mediation of fat, which goes over into the circulation in the same manner as starch-flour, though even more easily. Finally, the supposition may be offered, even if the direct proof is provisionally deficient, that all that is true of starch-flour, and in a higher degree of fat, may also be asserted of other insoluble bodies of finer division and, therefore, less permanence of form than the starch-flour. The supposition is not in any way contradicted by the discoveries of Auspitz, made in connexion with his well-known inunction experiments with mercury.

THE LUNG TEST.—M. Poncet showed, at a meeting of the Lyons Société des Sciences Médicales (Oct. 1871), the lungs of a fœtus prematurely born at the Hôtel Dieu. The child had cried, breathed, and lived an extra-uterine life of ten hours; but the lungs sank completely in water, as if no respiration had taken place. Such cases, though rare, have been mentioned by Hoffmann and Heister, and show the insecurity of the lung test in forensic medicine.—*Lancet*, 17th Feb. [Similar cases, though occasionally recorded, are yet extremely rare, as is stated even by the most zealous modern contemner of this test, Hanke. A reference to Casper's well-known work on Forensic Medicine, shows clearly enough that the insufficiency lies not in the test, but in the expert who knows not how to apply it properly, or how to interpret its indications.—ED. *E. M. J.*]

RETENTION OF URINE. PUNCTURE OF THE BLADDER WITH DIEULAFOY'S INSTRUMENT. By M. L'ABBE.—CASE 1. A mason fell from a considerable height stridelegs on a scaffold, bruising not only his perinæum but also the anterior wall of the abdomen. Next day a considerable swelling existed behind the scrotum, with intense pain and some tenderness of the belly. He had not been able to make water since the accident, and the bladder was distended nearly to the umbilicus. The catheter was attempted in vain by the house-surgeon, and again by M. L'Abbé, who then made an incision in the middle line of the perinæum, still without success in relieving the bladder. A protracted warm bath and a large dose of quinine were employed. But as everything failed to relieve the bladder, M. L'Abbé tapped it in the middle line above the pelvis with the syringe trocar, and withdrew between thirty and forty ounces of urine with great ease and little pain. Next day, after repeated failures with the catheter, the urine was drawn off three times by the trocar; and this was continued up to the patient's death on the fifth day. Death was due to rapid peritonitis, the result of the fall; but the bladder was healthy, containing a little normal limpid urine, and no clots or pus. The punctures appeared on the anterior wall of the bladder like fleabites, while no trace whatever of their presence remained on the inner wall of the organ.

CASE 2.—An old man, with an enormous prostate, suffered from complete retention. Various attempts to pass the catheter were quite unsuccessful for two days; he had lost a great quantity of blood, and was in great pain. M. L'Abbé rejected the idea of attempting the catheter, and at once punctured the organ with the trocar, drawing off above forty ounces of urine; a bougie was then passed with ease, and the patient made a good and rapid recovery.

This observation confirms the pathological researches of M. Sappey, which show that a notable difference in the direction of the prostatic portion of the urethra is caused by distention or emptiness of the bladder, making it difficult to sound a patient before the bladder is empty, while it may be easy afterwards.

These cases seem to show that puncture of the bladder, by the above means, is devoid of danger.

OBTURATOR HERNIA.—M. Chassaignac communicated to the Society of Surgery observations on a case of this rare lesion. He remarked on the few cases on record. Astley Cooper had seen only one in life. M. Cruveilhier had reported one. In this case M. Chassaignac found the patient suffering from two crural ruptures, the right one containing omentum and in a quiet state, the left one evidently containing bowel. Symptoms of obstruction were present, stercoraceous vomiting, distention pains, etc ; but operation was postponed, because the patient had had a stool, and it was considered that if these symptoms were due to hernia, operation was already too late.

Next day the symptoms had changed, still more vomiting, but numerous and abundant actions of the bowels. Symptoms of cholera, suppression of urine, no cramps, sore throat, and exhaustion; death in the afternoon.

At the post-mortem there was no peritonitis, but a third hernia was found, in the right obturator foramen, which was strangulated. The sac was partially covered by the obturator externus muscle.

M. Duplay called the attention of the Society to the interesting case of obturator hernia, reported by Drs Miller and Chiene in the *Edinburgh Medical Journal* for January 1871, and communicated it to the Society.[1]—*Gazette des Hôpitaux*, 1871, No. 111.

PENETRATING GUNSHOT WOUND OF THE CRANIUM; RECOVERY WITH THE BALL STILL IN THE BRAIN.—On 10th Oct. 1870, C. S., of the 81st of the line, was shot in the forehead. The wound was in the middle line, nearly one inch above the root of the nose, round, and about the size of a fifty-centime piece. The wound in the bone was small, but admitted a probe. Hæmorrhage was excessive, causing syncope. M. Fleschet introduced a probe about four inches before touching the ball, in the presence of several surgeons, who each for himself satisfied himself of the presence of a piece of metal. Ecchymosis of the conjunctiva of the right eye and droop of the lid were present. Vision was completely gone in both eyes from the moment of the injury. Brain-substance escaped with the probe. Next day, in the presence of Baron Larrey, the probe was passed its whole length into the cranial cavity without touching the ball, which must have gravitated backwards by its own weight. On the fourth day a little vision returned in the left eye, the right globe being still immovable and quite insensible to light. The head had to be kept absolutely still, or intense pain came on. The intellect was unimpaired and his spirits good; the patient insisting upon having his cigar regularly. He had no fever, thanks to the very free use of opiates, which calmed him and gave him refreshing sleep. Towards the end of the month the general health began to improve, and he was able to eat without pain, which at first he could not do. An attack of bronchitis did not seem to do him much harm, though the cough was troublesome.

On the 5th of November he was allowed to rise for a little, and could walk, keeping his head stiff and backwards. The wound, which suppurated freely for three weeks, was now almost healed, only a small sinus remaining, which discharged thin yellow serum.

At the end of November the pain, which had been constant in the back of the head, changed its position, and was felt on top of head and in forehead. Since the third day vision had been gradually returning in the left eye, and by the middle of December, though after some relapses, the patient was able to play at cards. By the middle of January the wound was completely closed, by a fibrous cicatrix. The external table of the frontal bone is deficient to the extent of a franc-piece. The appetite is perfect, and sleep uninterrupted; the patient plays at cards and walks about freely; in the first week of February he was allowed to go to a convalescent hospital.

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[1] Dr Chiene's name appeared as Dr Chieuc.

The facts of the case seem to make it impossible to doubt that the ball is really in the brain, and the symptoms would render it nearly equally certain that it had traversed the anterior lobe, and then, by its weight, made its way into the middle, and, perhaps eventually, the posterior lobe. Is the cure a perfect or permanent one? Has a protective cyst formed which will save the parts from injury? It does not seem unlikely, and it seems that surgeons have been too apt to exaggerate the danger of such wounds of the brain. Fracture of the skull with depression, with presence of fragments in the brain and with abscess, have often recovered. The above case is remarkable from the absence of fever, there having been no symptoms of stupor, delirium, cerebral compression, or hallucination. We cannot ascribe this happy result entirely to the opiates that were so freely given; still it is well to remember that, by the older surgeons, opiates were considered of great value in the treatment of injuries of the head. Vidal regards penetrating wounds of the brain as not so dangerous as many others, as the shock is less and the exit to pus is free. We believe that in cases like the above it is right to wait, and to make no attempt at extraction of the ball.

Two other cases bear on the subject. Dr B., Surgeon-in-Chief of Zouaves, was shot in the left side of the head when dressing a wounded soldier; was first insensible, but eventually recovered sensitiveness, and was hemiplegic and spoke with difficulty. After six months, during which the symptoms improved, he was foolish enough to commit an error in diet and wine, dying with cerebral symptoms in twenty-four hours. The ball was found encysted in fibrous structure in the substance of the brain. The second, a Spahi, had his cranium penetrated by a ball, and made a good recovery after some months; speech and memory being a little affected.—*Gazette des Hôpitaux*, Nos. 147, 148; 1870.

Note by Translator.—There are many similar cases in the records of surgery; experience shows, however, that a fatal issue, sometimes very sudden, may result from any indiscretion, such as over-excitement or intemperance, many months after the infliction of the wound.

ANTI-ODONTALGICS.—Those who have experienced the

> "Venom'd stang
> That shoots the tortured gums alang,
> And through the lugs gi'es mony a twang
> Wi' gnawing vengeance,"

will appreciate the following remedies proposed by M. Magilot to relieve their sufferings:—

1. ℞ Chloroformi; laudani de Sydenham (a compound wine of opium of the strength of 1 to 8), āā two parts; tinct. benzoini, eight parts; mix.

2. ℞ Tinct. aconiti; liquoris Hollandici ($C^4\ H^4\ CC^2$), āā two parts; tinct. benzoini, eight parts.
3. ℞ Chloroformi; creosoti; laudani de Sydenham, āā two parts; tinct. benzoini, eight parts.

The two first are simply calmative; the last is more energetic, by reason of the anæsthetic action of the creosote, for which pure carbolic acid may be substituted. The benzoin acts simply mechanically, being precipitated by the saliva among the fibres of the cotton on which these liquids are introduced into the aching tooth, it helps to retain the more active ingredients in contact with the part affected. A small bit of hydrate of chloral introduced into an aching tooth is also frequently useful, and the stopping may be made more permanent by soaking the cotton in mastic varnish, or by employing a piece of white gutta-percha softened in boiling water.—*Lyon Medical*, Jan. 1872.

Part Fifth.

MEDICAL NEWS.

Obituary.—On the 31st of January there died at Andersey, Torquay, George Edward Day, M.D., F.R.S., who was Chandos Professor of Anatomy in the University of St Andrews from 1849 to 1863, when he retired in consequence of broken health, the result of an accident which happened to him two or three years previously on Helvellyn. By this accident his right humerus was fractured at the surgical neck, and also two inches above the elbow, which was itself dislocated. The upper fracture remained permanently ununited, and caused considerable deformity and incapacity of the limb; and yet, in spite of this incapacity, which necessitated the lifting of his hand on to the writing-table, in spite of continually-increasing rheumatic ailments and consequent exhaustion, he continued to the last his literary labour in connexion with various journals both at home and abroad. His original works of importance are those on "Diseases of Advanced Life," and on "Chemistry in its Relations to Physiology and Medicine;" but besides these he published various articles in different periodicals, both professional and non-professional, and was a voluminous translator from both French and German.

John Otto, M.D.—Our readers must have been painfully struck by the sudden and unexpected death of Dr John Otto of Pathhead, who was so long and widely known, and so highly esteemed throughout the southern district of the county. Dr Otto passed as a surgeon in 1829, and for upwards of forty years maintained an extensive and successful medical practice in and around Pathhead. Nor was the usefulness of Dr Otto confined to the sphere of his professional labours; for, from his eminent business qualifications and friendly disposition, he was very often applied to by friends and neighbours for counsel and assistance in matters of difficulty, and to such applications he always readily assented. On public as well as on private grounds, Dr Otto will be very extensively mourned and missed.—*Dalkeith Herald*, 23d Feb.

Sir William Stirling-Maxwell was installed as Lord Rector of the Edinburgh University, on Monday 5th February, when he delivered a most lucid and admirable address, which, as reported in the public prints, consisted mainly of advice to the students in the conduct of their studies; in the course of which he enlarged pretty freely in favour of the female medical movement, and concluded by offering an annual prize of ten guineas for the best essay on a historical subject. We regret to say that Sir William's address was interrupted by such a noise of stamping, whistling, and penny-trumpet blowing, that it was impossible to hear it. We regret this much for the sake of the students themselves, who would unquestionably have been much benefited by the noble sentiments which flowed from the lips of the distinguished orator, and which were quite as exuberant with life as the students themselves, though rather more chastened by experience. Our contemporary the *Lancet* seeks an excuse for this disgraceful proceeding in the assumed fact, that the class of young men now attending the Edinburgh University is inferior socially to their predecessors of ten years ago, and it argues from this assumption that, in spite of its vast numerical superiority, Edinburgh has lost caste in comparison with London, and—as our contemporary modestly adds—other seats of learning. "Qui s'excuse s'accuse," and such a slur would upon any ordinary occasion have been allowed to pass uncontradicted; but the circumstances under which this statement has been made warrant us, we think, in making the assertion, based on our own personal experience, that at no period, during the past thirty years at least, have the students of the Edinburgh University been more numerous, or, taking them as a body, of a better educated or socially higher class than they are at present. It might not perhaps be difficult to find reasons for the present outbreak—possibly the spread of Good Templarism and the decay of "Oineromathic clubs," and similar harmless means of getting rid of the superfluous energy of youth, may have had something to do with it; and in this respect the continuous grind involved in the regulations of the General Medical Council may be partly to blame; but of this we are quite certain, that it is no decay in social quality that produced this noisy demonstration, though, probably enough, its element of quantity caused it to be more widely heard, and more hardly commented on.

Smallpox still prevails amongst us, though the admissions to hospital show a considerable diminution during the week ending

18th February from the preceding one, being only 178 against 201 in the preceding week. Still the disease, as shown by the mortality returns, is spreading amongst the classes who do not seek hospital relief. Here, however, it will be speedily checkmated by that provident re-vaccination which has been so general. Had it been universal, we would have had a very different return to make to the Registrar-General. The history of the present epidemic—if it ever be written, and we hope it shall be—if it brings out anything at all, will certainly bring out, with great prominence, the efficacy of re-vaccination as a preventive of death from smallpox, an efficacy even greater than that of a previous attack of smallpox; a fact well known and recognised by all writers on the subject, though too often ignored, especially by the public.

British Medical Service.—List of Medical Candidates of H. M.'s British Army who were successful at the Competitive Examinations held at London in August 1871, and at Netley in February 1872, after having passed through a course at the Army Medical School, Netley.

No.	*Names.*	*Studied at*	*No. of Marks.*
1.	Cottle, E. W.,	Oxford and London,	5118
2.	Ash, R. V.,	London and Aberdeen,	4625
3.	Connolly, P. S.,	Dublin,	4510
4.	Dwyer, C. E.,	"	4447
5.	Rogers, J. G.,	"	4445
6.	Fasken, W. A. D.,	London,	3993
7.	Connolly, B. B.,	"	3927
8.	Edge, J. D.,	Dublin,	3866
9.	Barrow, F. E.,	London,	3837
10.	Blood, R..,	Galway and Dublin,	3797
11.	Barrow, H. J. W.,	London,	3703
12.	Bridges, W. P.,	"	3695
13.	Drury, R.,	Galway aud Dublin,	3694
14.	Grant. W. C.,	Dublin,	3654

At the recent meeting of the Edinburgh University Court, Dr William Robertson, Mr Benjamin Bell, and Dr William Dumbreck, were appointed Examiners in Medicine for the ensuing year.

On the evening of 15th February, the Royal Medical Society had its annual dinner—Mr Edward Willis Way, M.B., C.M, the Senior President, occupied the chair, and Mr Lewis Shapter, B.A. Cantab., was croupier. The speeches of the evening in no respect exhibited any falling-off in ability, or in that tact and refinement of expression indicative of social position; and in spite of his strongly Conservative sentiments, Mr Shapter effectually brought down the house—to use a technical expression—when he stated his hope that we might still look forward, as well as back, to a period when

> "Britain's lifted finger and her frown
> Might call the nations up, and cast their tyrants down."

This meeting was further remarkable from the fact that, in the very home of Jenny Geddes, the Bishop-Coadjutor was called upon to return thanks for the clergy. It is surely no bad sign of the Edinburgh students when their representative social meeting is countenanced by the presence of the highest dignitary of any Church; and it is no small compliment to the teaching of our University when the alien element—we use the term in no derogatory sense—is found to be sufficiently strong to secure that the Church represented is the one most closely allied with their own.

SUBSCRIPTIONS TO GOODSIR MEMORIAL.

Collected by Dr M. WATSON.

Dr Andrew, Edinburgh,	£1	1	0
Thos. Annandale, Esq., F.R.C.S.E., Edinburgh,	2	2	0
Dr Ballantyne, Dalkeith,	1	0	0
Dr Mitchell Banks, Liverpool,	1	1	0
Mrs R. Barclay, Montrose,	1	0	0
Dr Buist, Perth,	1	1	0
Dr Caton, Liverpool,	1	1	0
Dr Coughtrey, Edinburgh,	1	1	0
Dr Halliday Croom, Edinburgh,	1	1	0
Dr Kirk Duncanson, Edinburgh,	1	1	0
Dr Finlay, Brechin,	1	1	0
Dr Thomas Fraser, Edinburgh,	2	2	0
Wm. Gourlay, Esq., Dundee,	2	2	0
Dr Gourlay, Weston-super-Mare,	3	3	0
Dr J. R. Hardie, Edinburgh,	1	1	0
Dr Howden, Montrose,	1	0	0
Dr Lucas, Dalkeith,	1	0	0
Messrs Maclachlan and Stewart, Edinburgh,	1	1	0
Dr Macdowall, Inverness,	1	0	0
Dr M'Intosh, Murthly,	£2	2	0
Dr Francis Moinet, Edinburgh,	1	1	0
Dr J. S. Muir, Selkirk,	0	10	6
Lawrence Pullar, Esq., Bridge of Allan,	5	0	0
Dr Alfred Pullar, London,	1	1	0
Hugh Rose, Esq., jun., Edinburgh,	1	1	0
Dr James A. Russell, Edinburgh,	1	1	0
Dr Scott, Musselburgh,	1	1	0
Dr Henry Steele, Montrose,	1	1	0
Mr Stirling, Edinburgh,	1	1	0
Professor Traquair, Dublin,	1	0	0
Wm. Watson, Esq., Edinburgh,	1	1	0
Dr Watson, Montrose,	1	1	0
Dr M. Watson, Edinburgh,	5	0	0
Dr S. Wright, Morningside,	1	1	0
Dr P. Young, Portobello,	1	1	0
A Former Pupil,	0	1	0
Dr P. Braidwood, Birkenhead,	1	1	0
Total,	£51	4	6

PERIODICALS RECEIVED.

American Journal of Insanity,—October.
American Journal of Obstetrices,—Nov.
American Journal of Syphilography and Dermatology,—January.
American Journal of the Medical Sciences,—October.
American Practitioner,—Nov. 1871 to Feb. 1872.
Annales d'Oculistique,—Sept. to Dec.
Australian Medical Gazette,—August to October.
Berliner Klin. Wochenschrift,—October 30, 1871, to February 19, 1872.
Birmingham Medical Review,—January.
Births, Deaths, and Marriages, Monthly Return, of,—October to January; Quarterly Return, Sept., Dec.
Boston Medical and Surgical Journal,—October 28.
British and Foreign Medico-Chirurgical Review,—January.
British Medical Journal,—Nov. 4, 1871, to February 17, 1872.
Bulletin Général de Thérapeutique,—Oct. 30, 1871, to February 15, 1872.
Detroit Review of Medicine and Pharmacy,—Nov., Dec.
Dublin Journal of Medical Science,—Nov. 1871, January 1872.
Food Journal,—Nov. 1871 to Jan. 1872.
Garden,—November 25.
Gazette des Hôpitaux,—Oct. 21, 1871, to February 22, 1872.
Gazette Hebdomadaire de Médecine, etc.,—Oct. 27, 1871, to Feb. 16, 1872.
Gazette Médicale d'Orient,—May 1871 to January 1872.
Glasgow Medical Journal,—November.
Journal of Anatomy and Physiology,—Nov.
Journal of Mental Science,—January.
Journal of the Gynæcological Society of Boston,—Nov. 1871 to Feb. 1872.
Journal of the Scottish Meteorological Society,—October.
Lyon Médical,—Jan. 21 to Feb. 18.
Madras Monthly Journal of Medical Science,—October 1871 to January 1872.
Medical Press,—November 1, 1871, to Feb. 21, 1872.
Medical Times and Gazette,—October 28, 1871, to February 17, 1872.
Medical World,—November.
Medizinische Jahrbücher,—Jahrgang 1871, Heft 4.
Monatsschrift für Ohrenheilkunde,—Nov.
New Remedies,—July.
New York Med. Journal,—Oct. to Dec.
Philadelphia Medical and Surgical Reporter,—September 30 to December 30.
Philadelphia Medical Times,—Oct. 16, 1871, to Jan. 15, 1872.
Practitioner,—Nov. 1871 to Feb. 1872.
Revue de Thérapeutique Medico-Chirurgicale,—November 1, 1871, to February 15, 1872.
Virchow's Archiv,—September 18.

Part First.

ORIGINAL COMMUNICATIONS.

Article I.—*Some of the Medico-Legal Relations of Insanity to Will-making.* By Arthur Mitchell, M.A., M.D., F.R.S.E., Commissioner in Lunacy for Scotland, etc.

In this paper the discussion of the relations of partial insanity to will-making, is resumed.

There is probably no case on record, in which the validity of a will, made by a partially insane person, was so clearly tried as in the case of Banks *versus* Goodfellow, before the Court of Queen's Bench, in 1870. Chief Justice Cockburn delivered a judgment in that trial, which was remarkable for its care and soundness; and it is probable that the views he then expressed, and the decision he came to, will hereafter rule the decisions of the English and Scotch courts in similar cases.

The testator was admittedly insane. He had been the inmate of an asylum, and he was the subject of certain fixed delusions. He believed that he saw devils or evil spirits, by whom he was pursued and molested, and he entertained an unfounded and violent aversion to a man named Featherstone Alexander, who was not a relative. He had epileptic fits, and it was not denied that his general mental power had suffered. The existence of the delusions, and the occurrence of fits after making the will, were also proved.

At first sight, this scarcely looks like a promising case. It presents a fixed delusion of a broad character, likely to operate on conduct in various and uncertain directions, and in addition to this, an induced weakness of intellect.

On the other hand, it appeared that the testator managed his own money matters in a sensible manner, and that his natural affections were healthy and active.

This man made a will in 1838, leaving all he had to his sister. She died, and he then sent for his solicitor, and gave instructions for the drawing up of a new will. When this was presented in proper form, he read it two or three times, said it embodied his instructions, and signed it. By this second will, he left all his property to his niece, Margaret Goodfellow, the daughter of his said sister, who was besides his heir-at-law. He had other nieces and also nephews, towards whom he always showed a healthy affection. His property was not such as would have made a provision for them all. He therefore provided fully for the niece, who, on her mother's death, became his housekeeper, who had been brought up in his house, and whose mother had been his housekeeper up to the time of her death.

The will therefore was a rational act, deliberately done. It was uninfluenced by, or showed no trace of, his delusion, nor indeed of his impaired mental powers.

Margaret Goodfellow, however, died two years after the testator, and at the time of her death she was under age, unmarried, and intestate. The property thus fell to *her* heir-at-law, who was not related by blood to her uncle, through whom she had acquired the property.

The possible consequence of her death without issue and intestate, was shown not to have occurred either to the testator or to his legal adviser.

The action was brought by John Banks, heir-at-law, after the death of Margaret Goodfellow, to the testator. He naturally felt aggrieved that his uncle's property should thus pass away from his own kith and kin. The question at the first trial, was the capacity of the testator to make a will, and the jury found that he was competent, and that the will was a good and valid one. The misadventure was held to be just what might have happened had the will been made by a man whose sanity had never been called in question, but to whom it had not occurred, and whose law adviser had omitted to point out that the niece, though young and healthy, might die under age, unmarried, and intestate, and that such an event should be provided against. A new trial was claimed, on the grounds that the judge had misdirected the jury, and that the verdict was against evidence, but the court rejected the claim.

The Chief Justice, in delivering judgment, said—"The question whether partial unsoundness, not affecting the general faculties, *and not operating on the mind of a testator in regard to the particular testamentary disposition*, will be sufficient to deprive a person of the power of disposing of his property, presents itself in the present case for judicial decision, so far as we are aware, for the first time; and we therefore feel ourselves warranted, and indeed bound, to consider the question as one not concluded by authority. The question," he added, "is one of equal importance and difficulty, and we have given it our best attention." Certainly no other case can be indicated, in which the question was so direct and pointed.

In the well-known case of Dew *v.* Clark, "the insane delusion had a direct bearing on the provision of the will. In such cases, the delusion being once proved, and its connexion with the will being manifest, there should be no difficulty in setting aside the will."

The peculiarity of the case in hand is, that the delusion could not be seen to have affected the provisions of the will; and it is this which makes it stand apart from others.

The very reverse, however, of the doctrine which decided this case, was laid down in other cases, as for instance in Waring *v.* Waring, and Smith *v.* Tebbit. In these two cases, the doctrine laid down may be shortly stated thus:—"To constitute testamentary capacity, soundness of mind is indispensably necessary; but the mind, though it has various faculties, is one and indivisible; if it is disordered in any one of these faculties, if it labours under any delusion arising from such disorder, though its other faculties and functions may remain undisturbed, it cannot be said to be sound; such a mind is unsound, and testamentary *incapacity* is the necessary consequence." This doctrine runs to nonsense, and refutes itself. Put in other words, it says that the indivisible mind has divisions; that these may be separately in a state of health or disease; that if some are diseased, the others, though in a state of health, are also diseased; that, therefore, some of them may be at the same time both in a state of health and in a state of disease, which is absurd, being within itself contradictory.

It is not, however, by any reasoning of this kind, but by the observation of fact, that we are led to reject this doctrine as erroneous.

It was scarcely judicial, I think, to assert that the mind is one and indivisible, and then build great theoretical conclusions on an assertion, which is both true and false, and true and false in a dozen ways.

"Every one must be conscious," said the Chief Justice in support of his sounder doctrine, "that the faculties and functions of the mind are various and distinct, as are the powers and functions of our physical organization. The pathology of mental disease, and the experience of insanity in its various forms, teach us that while, on the one hand, all the faculties may be involved in one common ruin, ... one or more only of those faculties and functions may be disordered; . . . that while the mind may be overpowered by delusions, which . . . utterly unfit it for the perception of the true nature of surrounding things, or for the discharge of the common obligations of life, there often are, on the other hand, delusions which, though the offspring of mental disease, . . . leave the individual in other respects rational and capable of transacting the ordinary affairs, and fulfilling the duties and obligations, incidental to the various relations of life." In such cases, of course, "the mind must, to that extent, be taken as unsound, just as the body, if any of its parts or functions is affected by local disease, may be said to be unsound, though all its other members be healthy, and their powers or functions unimpaired. But the question still remains, whether such partial unsoundness, if it leaves the affections, the moral sense, and the general power of the understanding unaffected, and is wholly unconnected with the testamentary disposition, must have the effect of taking away the testamentary capacity."

That question the court answered, in the case of Banks *v.* Goodfellow, by refusing a new trial, and thus affirming the verdict of the jury, that the will was a good and valid one.

In short, then, the present rule may be said to stand thus:—In an insane person, if the disorder be partial, and leave the faculties on which the proper exercise of the testamentary power depends unaffected, and if a rational will, uninfluenced by the mental disorder, be the result, that will ought to stand. In the first instance, of course, the presumption should be against any will made by a person who is in any sense or degree insane; but if the foregoing is proved, it should then be held valid.

I have not attempted to lay down any minute rules for the settlement of such cases; what I have endeavoured to do is, to disclose the principles, from a medical point of view, which should act as guides to us in their settlement.

So much, then, for partial insanity. We pass now to the consideration of lucid intervals.

The question of lucid intervals appears less frequently, and is altogether of less practical importance, in criminal than in civil cases. If an attack of insanity before the committal of the deed is ever dwelt on in a criminal case, it is generally for the purpose of asserting, that since that time the accused has never been in his right mind. In other words, there is no occasion for an effort on the part of counsel, in such cases, to establish the existence of lucid intervals; and as the court holds the accused to have been sane unless he is proved to have been insane, there is no effort on the part of the prosecution in such cases to establish intervals of lucidity. Casper says, that in hundreds of criminal cases in which he had been employed, the question of lucid intervals had never once presented itself.[1]

With one exception, I believe no penal code takes any cognisance of lucid intervals, but that exception is interesting. Article 83 (*sub.* 2) of the Hanoverian code runs thus:—"All those are exempted from criminal punishment who labour under any derangement or disease of the mind, by which they are deprived of the exercise of their reason. If the crime be perpetrated during a lucid interval, the condition referred to can only be regarded as a mitigating circumstance."[2] Here we have not only a recognition of lucid intervals in criminal cases, but also—what is quite as unique in penal codes—an acceptance of the plea of insanity *in mitigation* of punishment. This law accepts the existence of lucid intervals, and then proceeds to deal with them as never complete. It does not altogether say, *Semel furiosus, semper furiosus presumitur.* What it does say, I can perhaps better express in an old Scotch proverb, *Ance wud, aye the waur;* and for that reason, to be dealt with leniently.

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[1] Forensic Medicine, iv. 234.

[2] Casper, op. cit., iv. 231.

But though the question of lucid intervals rarely appears in criminal, it appears very frequently in civil cases, where it may assume a position of much importance. It appears with special frequency in those cases which relate to wills, since by the laws of this, and of nearly all other countries, a person who has been insane can execute a valid testament during what is called a lucid interval.

What, then, is meant by a lucid interval? It may refer to two states:—1*st*, To clearly periodic intervals of lucidity in the course of an attack of insanity; and, 2*dly*, To such remissions of the symptoms as may be regarded in the light of temporary cures. The first would resemble the intermissions in ague; while the second would resemble recurring bronchial attacks. In the first, the insanity is supposed to be merely slumbering—in the second, to be temporarily gone. But is it true that we have any forms of insanity with intervals of lucidity at all exhibiting the periodicity which occurs in ague? My answer to that is, None that I know of. We have a large number of cases, however, in which well-marked remissions occur, which, for the time being, amount almost to a restoration to sanity, but which present themselves at irregular intervals, and are of uncertain duration. The intervals may be, it is true, more or less nearly equal in some instances—so nearly so as to justify our looking for an exacerbation at a particular time—but, notwithstanding this, we have to do here with something quite different from the wonderful periodicity exhibited in ague. These remissions resemble more nearly the intervals between such things as epileptic seizures, or attacks of angina or gout. Even in the best marked cases of what has been called *la folie circulaire*, in which periods of excitement, depression, stupidity, and lucidity succeed each other again and again, there is nothing of the regularity and order which is exhibited in the periodicity of ague. Nor is it more correct to regard in this light those exacerbations of mental disease which coincide with, and are in fact due to, other periodic phenomena, such for instance as the menstrual discharge. In short, the so-called lucid interval resolves itself into a remission or disappearance of the symptoms, which, for the time being, more or less resembles a cure. A patient has a bronchial attack which yields to treatment; but we may know very well from his history, or from the cause of the attack, or from some concomitant, that he is almost certain to have other attacks. We may, perhaps, feel able safely to predict a long succession of them. Such a case, and not a case of ague, illustrates the lucid intervals of insanity. And just as we might have some doubts as to whether we should regard the patient, between the bronchial attacks, as cured, so there may be doubts—doubts of exactly the same character—as to whether these lucid intervals in insanity should, or should not, be regarded as temporary states of cure. "What difference is there," Georget asks, "between a lucid interval and a cure? A patient who every year has an attack of mania disappearing during some months, or has an attack of mania every two or three months, is he cured between the attacks, or has he only lucid intervals? We may admit," he goes on to say, "that a patient who recovers his reason for a month only, to lose it again, and so on, has nothing but lucid intervals; and that he who is well for at least six months of the year is cured, and may recover the rights he has lost. I believe we may even admit also, that an individual who is insane for three quarters of the year, enters in the category of those who have only lucid intervals." This was all the precision that one of our best and clearest writers on the medico-legal aspects of insanity could attain in this matter. It follows, therefore, that in describing a patient as being cured, or as being in a lucid interval, we are using terms arbitrarily chosen, and are not speaking with scientific precision.

Having thus explained what these intervals really mean, I next ask whether the lucidity, which is manifested during them, is ever complete? The answer to this is, that it would be extremely difficult to say that in any of them there is a perfect restoration to reason, while in most the restoration is certainly only partial.

In a great many other diseases, when the attack passes off, the patient is not left where he was before the seizure. This, indeed, may be said to be almost always true when there is a succession of attacks; so it is with insanity—perhaps more so with it than with any other disease, because it involves so delicate and complex an organ as the brain. Even when excitement is gone, and delusions have vanished, and the talk and conduct are rational, and the bodily health seems good, there will generally remain a weakened mental power, and a detectable, but scarcely nameable, something in the operation of the mental faculties, and in the patient's manner, which reveal instability of mental health, and raise apprehensions as to the future.

Dr Combe says—"However calm and rational the patient may appear to be during the lucid intervals, as they are called, and while enjoying the quietude of domestic society, or the limited range of a well-regulated asylum, it must never be supposed that he is in as perfect possession of his senses as if he had never been ill. In ordinary circumstances, and under ordinary excitements, his perceptions may be accurate, and his judgment sound, but a degree of irritability of brain remains behind, which renders him unable to withstand any unusual emotion, any sudden provocation, or any unexpected and pressing emergency."[1]

But may not the restoration to sanity, though not absolute, be sufficiently complete to justify the withdrawal of civil disabilities, and to restore the patient to the free exercise of his civil rights? In a large number of cases I believe that this occurs, and to continue to withhold these rights would be an injustice.

Legrand du Saulle says that there is no alienistic physician who does not know from experience that one or more attacks of insanity may leave, during lucid intervals, a sufficient clearness of mind for the rational execution of a last will and testament.[2]

Foderè says that during a lucid interval a patient may enjoy all his reason, and may act and judge in all respects like other men.[3]

Langer says that when real intermissions occur in a psychosis—that is, when the symptoms which characterize the condition have ceased—we are not authorized to assume, in a judicial point of view, a state of disease. Responsibility and competency therefore return.[4]

It would be easy to multiply such opinions as these.

It is not necessary that the patient should be quite what he was; for, if he had never been worse than he is during such an interval, he never would have lost those rights, the restoration of which he claims. This view of the point should never be lost sight of. Just as persons, between ague fits or bronchial attacks, may be able, though not perfectly well, to resume their ordinary avocations; so persons, between attacks of mental disorder, may so far recover the exercise of their reason as to be able to resume their rights and responsibilities. Without adopting the extreme opinion of D'Aguesseau (1698), that a lucid interval is "not the dawn, which joins night to day, but perfect day itself,"[5] it has been conceded as a fact that there is often a sufficient approach to the perfect day, though dark night may precede and follow it, to make it fair to the individual, and safe for society, that disabilities should be removed during those periods. During the insanity of Charles VI., when a lucid interval occurred, the powers of the regency were suspended, and he resumed his regal authority with great advantage to the kingdom.

It is quite clear from what has been said, that the measure of the restoration in these cases must and does differ greatly. I do not know precisely what the *perfect* day of reason is; but it is certain that patients, who are said to be in lucid intervals, stand at different distances from it. The mental state of a lucid interval is not one which is uniform, or which we can outline with sharpness; for we cannot even define the general states of sanity and insanity. And it must never be forgotten, that we are just as little able to do this with regard to the body as with regard to the mind. Our uncertainties as to the value of mental states may have a greater practical importance, but they have no fuller existence than our uncertainties as to bodily states. It is of importance that this should be borne in mind, so that positive and dogmatic speaking in reference to such matters may be avoided, and difficulties freely acknowledged, where difficulties exist.

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[1] Combe on Mental Derangement, p. 241.
[2] La Folie devant les Tribunaux, p. 159.
[3] Ray's Med. Jur. Edin. 1839, p. 219.
[4] Feuchtersleben, Med. Psych., p. 374.
[5] Legrand du Saulle, op. cit., p. 109.

It follows, I think, that all cases in which the question of lucid intervals is raised must be judged of separately—that is, each case must be considered on its own merits. No two cases will be alike. Each case will have peculiarities, and these may refer either to the actual state of the patient, or to the history of a previous interval.

Law and medicine, then, both admit the existence of the so-called lucid interval—that is, of a marked remission in, amounting to a temporary disappearance of, the symptoms; and both agree that during such intervals there may properly be a resumption of rights and responsibilities. The medical question will relate to the character, the completeness, and the sufficiency of the lucidity; and it will generally be as easy or as difficult to determine this, as to determine when a *cure* should be pronounced, in the sense, that is, of a permanent cure. *Cure* replaces the patient, as a matter of course, *in statu quo ante*, and he is then "treated precisely like any other person of sound mental health."[1] But cures are often declared when no real cure has taken place. Such occurrences present themselves in the experience of every man who is practically engaged in the treatment of insanity. Casper tells the story of a man who called on him immediately after being dismissed as *cured* from an asylum. He found the patient composed, rational, and perfectly clear. Accidentally, towards the close of the interview, the patient unbuttoned his overcoat, when there was seen, on the frock-coat beneath, a star of pasteboard and gilt paper—"the order," he said, with a self-complacent smile, "which he had received on account of his relationship to the Hohenzollerns."

The most complete of cures, in fact, are too often nothing but long and undetermined intervals of lucidity; the tendency to relapse in mental disease being peculiarly great.

To show how vague and undetermined this whole matter is and must be, we have only to ask such questions as these:—Who can tell the exact time when a cure is accomplished? or, Who can tell precisely when an interval of lucidity commences and ends? Do not considerations of expediency and probability always shape our answers?

Hoffbauer was magnificently arbitrary on this subject. He said there were three kinds of lucid intervals—one in which the interval was shorter than, another in which it was equal to, and another in which it was longer than, the attack. In the first of these—those in which the interval is shorter than the attack—he thought disabilities should not be removed. In the cases, again, in which the interval is longer than the attack, he said the patient might be regarded as in the position of a man whose faculties are intact, whose acts are those of a sane man and who should have the same civil rights and responsibilities as other men. The difficulties, he thought, relate only to the cases in which the lucid interval equals the attack in duration, for the reason that the man has not time to return to himself, the succession of attacks and lucid intervals making these last doubtful.

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[1] Casper, op. cit., p. 232.

All this is purely arbitrary; for as things actually happen, we know very well that the lucidity exhibited in a short interval may be much clearer than that exhibited in a long one.

In looking at lucid intervals, however, there are some medical experiences which it is useful to bear in mind, such as these:—

In the case of an idiot, an imbecile, or a confirmed dement, for instance, lucid intervals cannot of course occur, just as there cannot be a temporary, or any other, cessation of lameness in a man whose legs are cut off. Again, if lucid intervals ever occur in the progress of cases of acute dementia, they are of extreme rarity. They are also very exceptional in the states called monomania—that is, in cases exhibiting one or two prominent fixed delusions of long standing.

Again, the mere transition from agitation to calm does not constitute lucidity, for, after excitement has ceased, there may be as much mental derangement as while it lasted.

There occur, in some acute cases, momentary exhibitions of lucidity which are of good omen, and may be the forerunners of convalescence, but these are too short to be of much practical value; yet even during them wise words may be spoken and wise acts done; but it would be inexpedient, as a rule, to deal with these as intervals of lucidity. Fortunately we are not likely to be often asked to do so. If the act of such a patient were held to be valid, the rationality of the act itself would nearly always be the chief proof of the lucidity and competency.

"Little stress," it has been well said, "ought to be laid upon those occasional and uncertain disentanglements of intellect, in which the patient is for a moment only extricated from the labyrinth of his morbid hallucinations."[1] And as little, I think, on instantaneous cures. Personally, I know nothing of those marvellous cases "in which the curtain of melancholy delusion is suddenly withdrawn; where the eye of the mind seems to be couched all at once by a miracle of almighty power."[2]

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[1] Reid on Nervous Affections, p. 318.

[2] Reid, op. cit., p. 320.

We come now to look more closely at the view which the law takes of the so-called lucid interval.

The Roman law openly recognised their value. "If the lunatic," it said, "has recovered his reason, or if he has made his will during a lucid interval, the will is held to be valid." The Code Napoleon does not directly recognise it, but it is so framed as not to exclude it. Art. 90 simply says, "To make a will, it is necessary to be of sound mind;" and the assumption is, that during a lucid interval there is soundness of mind.

The Prussian Code enacts, that "Persons who are only occasionally deprived of the exercise of their reason may make valid preparations for death during a lucid interval;" and I have shown that the Hanoverian law not only recognised these periods of lucidity in civil, but also in criminal cases. The Rhenish Civil Code, however, gives no privilege to the lucid interval, interdicting all who are usually in a state of idiocy, insanity, or mania, even though subject to periodic lucid intervals, and wills made during such intervals, by this code, are not valid.

The English law, again, makes a lunatic responsible, and gives validity to his acts during a lucid interval. Indeed, "all acts done during a lucid interval are considered as those of a person perfectly capable of contracting, managing, and disposing of his affairs at that period, and this rule applies to wills as well as contracts."[1] The lucid interval being proved, the will is as valid as if the testator had never been insane. By such an interval, however, Lord Thurlow is reported to have said, that "he did not mean a cooler moment, an abatement of pain or violence, or of a higher state of torture, a mind relieved from excessive pressure, but an interval in which the mind, having thrown off the disease, had, for the time being, recovered its general habit."

I come now to another aspect of the question:—If a person makes his will before he has been shown to be insane, then it is presumed by the law that he was sane when he made it; and if any one attacks it, he must prove the insanity of the testator. But if he has been shown to be insane before he made the will, then the presumption and the burden of proof change—it is then presumed that, having been insane, he continues to be insane, and the party setting up any instrument after insanity has manifested itself has the burthen of proof cast upon him; he must, in short, show recovery.[2] "If it can be established," said Sir William Wynne, in the case of Cartwright *v.* Cartwright and others, "that the party afflicted habitually by a malady of the mind has intermissions, and if there was an intermission of the disorder at the time of the act, that being proved is sufficient, and the general habitual insanity will not affect it; but the effect of it is this, it inverts the order of proof and of presumption; for, until proof of habitual insanity is made, the presumption is, that the agent, like all human creatures, was rational; but where an habitual insanity in the mind of the person who does the act is established, then the party who would take advantage of the fact of an interval of reason, must prove it."

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[1] Shelford, op. cit., p. 289.

[2] Shelford, op. cit., p. 290.

"There does not appear," he goes on to say, "any authority or law to prove what the length of the lucid interval is to be, whether an hour, a day, or a month; all that is required is, that it should be of sufficient length to do the rational act intended; if it is established that the act done is perfectly proper, and that the party who is alleged to have done it was free from the disorder at the time, that is completely sufficient."

There is another point to which I beg to direct attention. It is this:—In what way does the character of the will affect the establishment of a lucid interval? Shelford says,—"If a will made by a lunatic is rationally drawn up, and the nature of the disorder was such as to afford any reasonable ground to suppose that a lucid interval may have prevailed, the act itself furnishes a very strong presumption of that sound and disposing mind which is necessary to its validity." With reference to the same point, Sir William Wynne observes, that "the strongest and best proof that can arise as to a lucid interval is that which arises from the act itself, which is the thing to be first examined; and if it can be proved and established that it is a rational act rationally done, *that* is sufficient." Brierre de Boismont tells us that, by a decree of the Court of Paris, "the wisdom alone of the act confers on it a right of presumption that it has been done in a lucid interval."[1]

Great weight should, I think, be accorded to the character of the will, and it will certainly not be too much, if we receive it, when it is rational, as very strongly supporting any other evidence of lucidity. It has been said that testaments are mirrors in which the makers of them are pictured, and there is assuredly much truth in this. Whether wise men generally make wise wills or not, it is of a verity that fools generally make foolish wills, when such wills are really their own acts. Therefore, when a will is a rational one, it should be received as strong evidence that its maker possessed a testamentary capacity. We cannot help regarding rational acts as evidence of an ability to act rationally; or, at least, of relevant competency.

I have thus briefly sketched the drift of the law's dealings with lucid intervals in will cases. But the law does not always deal with such states on the same principles. One illustration I shall give, because it is not generally known:—When a witness has had an attack of insanity between the date of an event, and his examination regarding that event, though he be restored to lucidity, his testimony cannot be received—he cannot be examined. In other words, quoting from Hume on Crime (vol. ii. p. 340), a witness is disqualified for giving evidence about any matter which fell under his observation in his season of sound health, if a fit of derangement have succeeded, even though at the time he is required to give evidence he be in a lucid interval, or, for the time being, in a state of perfect mental health. He could make a valid will then, as we have shown; but about any event which happened before the attack, his evidence is of no value. It is difficult to see what has guided lawyers to this conclusion, but it has certainly not been medical experience.

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[1] Legrand du Saulle, op. cit., p. 162.

A case of this kind occurred recently in Inverness, in the trial of Thomas M'Kenzie for assault and robbery. John Scott was cited as a witness, but it was objected that he was disqualified, having been the subject of an attack of insanity between the date of the fact to be proved and the examination. The objection was sustained, though the Medical Superintendent of the Inverness Asylum, under whose care he had been, and still was at the time of the trial, declared him to be then "in a perfectly healthy mental condition," with his "memory not in any way impaired," and "able to give a clear account of anything that happened previous to the attack." In sustaining the objection, the judges admitted the point to be one of difficulty and delicacy. Medical men would have received Scott's evidence without hesitation; but though in this case law and medicine do not agree as to the influence and bearing of lucid intervals, I think I have shown that there is a fair agreement between them as to the value and bearing of lucid intervals in cases which relate to wills.

This concludes the remarks I have to offer on this second part of my subject.

It has been my endeavour in discussing it not to speak too positively, nor to make strong assertions, nor to lay down inflexible rules, but rather so to state the case as to lead to conclusions which are probably sound and just to all concerned. It has been my special wish to leave a clear impression that every case must be looked at separately, and judged of in the light of the whole circumstances. It does not appear to me that the law has any desire to ignore special knowledge in these matters. On the contrary, I think a careful study of the whole body of recorded decisions must leave the conviction, that the law is ready to be guided by medical experience. Medical men, however, have sometimes confounded theory with experience,—a confusion which lawyers have properly resisted, but of which they too in this same matter have not unfrequently been guilty.

In the next paper, I take up the consideration of the medico-legal relations of insanity to will-making in those cases in which the alleged incompetency rests on mere feebleness of mental power.

ARTICLE II.—*Case of Hæmorrhage resulting from an Internal Wound of the Œsophagus treated by Operation.* By THOMAS ANNANDALE, F.R.S.E.; Surgeon to the Edinburgh Infirmary, and Lecturer on Clinical Surgery.

ON the 18th of November 1871, I was asked to meet in consultation Dr Balfour, of Portobello, in regard to the case of Miss J., æt. 52, who had been the subject of hemiplegia (on the left side) for several years.

Three days before my visit, the patient when dining felt a portion of chicken or ham bone lodge in her throat. This accident was followed by great pain and difficulty in attempting to swallow, and a few streaks of blood were noticed to pass by the mouth. The day after the accident a small swelling formed over the inner border of the left sterno-mastoid muscle, about the middle of the neck. The pain and difficulty in swallowing continued unabated for the next two days, and the swelling in the neck slightly increased, and became tender to the touch.

On examining the patient, I found a small circumscribed inflammatory swelling, the size of half a small walnut, in the region of the neck already referred to. The swelling was hard, and no fluctuation in it could be detected. An ivory-headed probang being passed down the œsophagus, struck against some hard substance on the left side immediately opposite the swelling in the neck. The probang having been withdrawn, a pair of long œsophageal forceps was passed down to the site of the body, but the latter could no longer be felt. A second introduction of the probang led to the same result, for, after a very careful search, no foreign body could be detected. The patient was then asked to swallow some bread and to drink some water, when she at once declared that the pain and difficulty in swallowing were gone, and that she no longer felt anything in her throat.

On visiting her next day with Dr Balfour, it was found that she continued free from her old symptoms, and only suffered from a *slight soreness* in swallowing. The swelling in the neck was decidedly less prominent. As no further special surgical treatment appeared necessary, I ceased my attendance, and heard no word of the case until the 26th, seven days after my last visit, when I received an urgent message to see the patient. On my arrival Dr Balfour informed me that the patient's progress had been perfectly satisfactory up to early that morning, when hæmorrhage had suddenly taken place from the mouth. The blood brought up was arterial and unmixed, except with a little saliva and mucus. The swelling in the neck had disappeared, but there was a slight fulness remaining in its situation. A mixture of gallic and sulphuric acids had been given, and the bleeding had stayed, but the patient was pale and weak. It was decided to continue the acid mixture, and to give ice and iced milk to swallow.

In the afternoon, Dr G. Keith of Edinburgh, at the request of the patient's friends, joined my colleague and myself in consultation, and as the bleeding had not returned, the continuation of the treatment was recommended. About nine o'clock the same evening, Dr Keith and myself were requested to meet Dr Balfour again, as the hæmorrhage had returned more actively than before. The appearance of our patient was truly alarming. She was lying in bed, pale, and exhausted, and bringing up every few moments large mouthfuls of pure arterial blood. Unless something was done at once to stay the bleeding, it was evident that the case was hopeless, and therefore, at the brief consultation we held, I suggested the justifiability—under the circumstances—of cutting into the neck, with the hope of discovering and removing the source of the hæmorrhage, which appeared to me to be connected with the lodgement of the foreign body in the œsophagus.

My colleagues having agreed to the proposal, the patient was put under the influence of an anæsthetic (a mixture of chloroform and ether). I then made an incision on the left side of the neck as if for tying the common carotid below the omo-hyoid muscle, and having exposed this artery a little below this muscle, I passed round it a loose ligature of catgut, intending it to be a ligature of reserve, by means of which the artery could be secured if necessary. A careful dissection was then made to the inner side of the artery so as to lay bare the œsophagus, with the result of exposing a wound of this canal. The wound was a quarter of an inch in length, situated on the left side, and passed completely through the walls of the canal. Its edges were somewhat ragged in appearance, and a continuous oozing of arterial blood was taking place from them. A very fetid odour was also noticed to come from the wound. A probe passed into the wound, and moved up and down in the œsophagus, did not detect any foreign body. On searching more carefully for the source of the hæmorrhage, a small branch of an artery was found entering the œsophagus close to the wound. This vessel passed upwards from underneath the carotid, and was, from its situation and direction, considered to be a branch of the inferior thyroid artery. A ligature passed round this small branch by means of an aneurism needle and secured, at once stayed the bleeding. The margins of the wound in the œsophagus having been freely touched with the tincture of the muriate of iron for antiseptic effects, the edges of the wound in the neck were brought together with sutures.

The morning after the operation, the patient was fed with a tube introduced by the mouth and passed down the œsophagus below the situation of the wound. She had passed a quiet night, and there had been no return of the bleeding. The temporary ligature round the carotid was removed. For the next four days the patient's progress was most satisfactory. There was no return of the bleeding, and the wound was healing well. She was fed by means of the tube regularly twice a day.

On December 2d, the wound presented an unhealthy appearance, and there were signs of sloughing of its edges, which had somewhat separated since last account. A little bleeding had taken place from the wound, but the application of the muriate of iron checked it.

On December 4th, the patient's general symptoms were not promising; the wound also presented a sloughing appearance in its whole extent. A little more bleeding took place from the wound, but was stayed by a compress steeped in the muriate of iron.

Dec. 5th.—The patient's strength has rapidly diminished since yesterday, and she is fast sinking. Died the same day. No post-mortem examination was allowed.

Remarks.—In connexion with this case, I would briefly remark—(1*st*) On its nature; (2*d*) On the operative treatment adopted; (3*d*) On its result.

1*st.* The history of the case, the detection of the foreign body by means of the probang, and the condition determined at the operation, are, I think, sufficient proof that a sharp fragment of bone had lodged in the œsophagus and wounded its walls. This wound had been followed by ulceration, which, in its progress, had involved the arterial branch and caused the hæmorrhage. It seems probable that my first introduction of the probang displaced the bone, and that this accounted for the relief of the symptoms and the disappearance of the inflammatory swelling in the neck. Had the bone remained in its original situation, an abscess pointing externally would have been the result. From the fact that no difficulty in swallowing was experienced after the introduction of the probang, it is likely that the bone passed down into the stomach.

2*d.* Had I not possessed a clear history of this case, and had I not also distinctly felt the bone, and ascertained its position, operative interference would scarcely have been justifiable; for although the blood was evidently coming from the pharynx or œsophagus, it was impossible to be certain as to its exact source.

As, however, the patient was dying from apparently unrestrainable hæmorrhage, and as there seemed to me a great probability that the bleeding was connected with the injured portion of the œsophagus, I undertook the operation with the hope of finding and removing the cause which was acting so fatally. Under the peculiar circumstances of the operation, I thought it a safe plan to first expose the carotid artery below the supposed site of the bleeding, and place round it a loose ligature; for it was likely to be this vessel, or some of its branches, which was wounded. This proceeding was not attended with any special danger, and if any sudden gush of arterial hæmorrhage took place in the progress of my further dissection, I expected to be able at once to check it by securing the ligature. The discovery that the wounded vessel was not a branch of the carotid but of the subclavian artery, is an excellent, but, at the same time, rare illustration of the important principle in the treatment of wounded arteries, namely, to search for the bleeding point itself, and secure it if possible. Ligature of the carotid artery in this case could have had no influence in restraining the hæmorrhage from the bleeding vessel.

3d. The progress of the case for the first few days was all that could be desired, and had the local (hemiplegic) and general condition of the patient been more satisfactory, a favourable result might reasonably have been anticipated. The hæmorrhage from the mouth never returned after the operation, and although some bleeding took place from the wound after it assumed an unhealthy appearance, it came from the sloughing surfaces of the wound, and not from the original site of the œsophageal hæmorrhage.

In conclusion, I may be permitted to acknowledge the valuable assistance and support which I received from Drs Balfour and Keith in carrying out the treatment of this most anxious case. Although sincerely regretting the fatal termination of the case, we felt, and I think with some justice, that our treatment had saved the patient's life at the time, and prolonged it for several days.

ARTICLE III.—*Notes from Practice.* By JOHN BALFOUR, L.R.C.S.E., I.G., Leven.

Vaccination, Primary, in the Adult.—On the 18th January I was waited on by John G., aged 22, who requested vaccination, stating that the operation had not been performed during youth in consequence of delicacy. As he was in good health, I at once acceded to his request, asking him to return and show himself on the eighth day. When that time had come round, fearing that he might forget his promise, I hunted him up at his work, and put him in mind of it; but, notwithstanding, he failed to show himself. On the evening of the twelfth day, however, he came to my surgery, stating that, from the ninth day up to the present time, he had been quite unable to work, not so much from the arm (though that had been painful) as from general discomfort, loss of appetite, etc.—in short, from slight fever. He is now, however, better. The vaccination had taken well, with considerable swelling and full inflammation, and a good areola. The two latter are just fading away, the vesicles have been full-sized, and are now blackening into crusts.

Re-vaccination in a Lady aged 40.—Was vaccinated in India as a child, again in England at the age of eleven,—both times successfully,—several times since without result. On the arms are two small but distinct cicatrices from the first, and a large, very indistinct one from the second vaccination. On the 29th January, I performed vaccination from a fresh arm: the punctures felt hot and stinging for the rest of the day. Second day, vesicles forming slight surrounding inflammation; sick, feverish, and good for nothing all day. Vesicles increased to the sixth day without pain; on that day, however, was again slightly feverish, the vesicles nearly the size of a threepenny-piece, flat, with edges sloping into the skin; inflammation extending to an inch and a half round each vesicle, and a slight attempt at an areola. On the eighth day the inflammation was almost gone, and crusts forming; on the tenth day the crusts fell off.

Re-vaccination, Bad Effects from.—A gentleman of middle age, with a remarkably good cicatrix—large, clear, and well foveated—allowed himself to be re-vaccinated by a young acquaintance. The operation was performed on the upper part of the left forearm. He left home during the afternoon, and missed the last train home. During the night the arm became very painful, and next morning he described the vaccination as being as large as a pigeon's egg, and himself in a very uncomfortable state. Being Sunday, he could not get home, but returned on Monday afternoon, when I at once saw him. I found my patient in a very unpleasant state,—the tongue loaded, pulse about 130, skin very hot and dry, and the whole of the left forearm erysipelatous, much swollen, and with a very angry appearance. He was at once put under tinct. ferri mur. in full and frequent doses, the arm put up with lead-and-opium wash, hot, and means taken to act freely on the bowels and liver. The erysipelas after this did not spread, but it was Thursday morning before there was any decided improvement. On that day the pulse came down a good deal, the arm was less tense, and the colour paler; the urine, too, which at first was very scanty, and deposited lithic acid, became copious and normal. On Monday, the tenth day from the vaccination, fluid was fairly made out burrowing under the skin, and, by an opening in the most suitable part, between six and seven ounces of matter, purulent, reddish, and rather thin, were withdrawn: this gave great relief. Arm now rubbed over with a weak solution of carbolic acid and oil, and rolled up in wadding. Three days after, more fluid was discovered farther forward, and by a second opening about a couple more ounces of matter similar to the first were evacuated. Since that all has gone on well: the arm is now of normal size, sound, so far as I can make out, the openings healing, and my patient gaining daily in health and strength.

Late or Delayed Cowpox.—These are occasionally met with, the disease running a perfectly normal course, except that it may be from one to three or even more days later in reaching every stage than should have been the case. I think the general feeling is to consider such cases successful, and this has been my own practice. Last autumn, I had the following opportunity of testing the correctness of this view:—On the 3d December I vaccinated E. K., of Methil. Four days afterwards, or on the fifth day, in passing through the village, I was told by her mother that the arm "had not held." As the child was close on six months of age, it was an object to repeat the vaccination at an early date; so, three days afterwards, I took up some fresh matter. On looking at her arm, I found one of the pocks holding well, but only equal in size and appearance to what it should have been on the fifth day. I at once determined to vaccinate again, and so, by means of Bryce's test, to try the efficacy of the late pock. On returning four days after, I found the original pock fully developed, with a fine areola forming, and the two later ones equal (very nearly) in size to the first, and also with well-developed areolas round them.

I do not think many remarks on these cases can be required. The first case was interesting to me as showing the amount of feverish suffering in an adult when vaccinated for the first time; the second, as it appeared a good typical case of re-vaccination which I had the opportunity of carefully watching; the third points out the risk occasionally incurred when the person to be vaccinated is not in good health; and the fourth will give increased confidence to the opinion that a late pock, which otherwise runs its course normally, may be accepted as an efficient protection against smallpox.

ARTICLE IV.—*Case of Strychnia-poisoning, treated by the Administration of Chloral Hydrate.* By ANGUS MACDONALD, M.D.

MR J. C., aged about 32, by profession a teacher, and residing in Norton Place, Edinburgh, had been, for one or two months back, in the habit of taking five drops, three times a day, of the liquor strychniæ of the British Pharmacopœia, prescribed by me with the view of benefiting a chronic bronchitic affection from which he suffered somewhat. His general health, however, was excellent, and he had hitherto experienced no disagreeable results from the continued use of the medicine. On the morning of Monday the 30th of January 1872, he took his usual dose before breakfast, at 8 o'clock A.M., but thought he felt the taste of the medicine more than usually bitter, and was not sure but he might have taken eight drops, but did not think he had exceeded that quantity. He immediately afterwards took breakfast, and left home about twenty to twenty-five minutes past 8 o'clock, without feeling in any way ill. When he got to the middle of the London Road, about a quarter of a mile from his home, he felt giddy, and experienced a tendency to stagger. He hurried along to Elm Row, another quarter of a mile further, and, entering the first shop he came to, asked the shopkeeper to send for a cab; and after being helped into it, drove straight to my house in Northumberland Street, where he arrived at a quarter to 9 o'clock.

During the period between the first seizure and the time I first saw him, the patient had been getting gradually worse and worse, and I found him unable to get out of the cab, as his lower limbs were rigidly extended, his neck and trunk extended, his occiput pushed forcibly against the back of the cab. His intellect was perfectly clear, and he now briefly explained what had happened to him; but as any attempt at flexion of the body brought on severe tetanic spasms, I had to get the assistance of the cabman to turn him lengthwise across the cab; and having thus got him out of the vehicle, we carried him into my consulting-room. He looked exceedingly anxious, and complained of severe pain, like the effect of an electric shock, every time the spasms came on, which at this time recurred at intervals of less than a minute.

I at once proceeded to administer chloroform by inhalation, and at the same time sent my servant to the nearest druggist's for a solution of the hydrate of chloral of definite strength. The chloroform gave immediate relief, but it was only of a temporary character, for after three or four minutes the tetanic spasms were nearly as bad as before he was removed from the cab. About nine o'clock I administered (with considerable difficulty, as every attempt at swallowing aggravated the tendency to spasm) about thirty grains of the chloral hydrate. After an interval of from five to seven minutes, perceiving that the spasms, though somewhat less frequent and less severe, were still very distressing, I administered other twenty grains of the hydrate. Shortly after this the spasms diminished rapidly both in frequency and in severity, succeeding each other at intervals of two, three, and five minutes respectively, until about half-past 9 o'clock, when they ceased altogether. The patient shortly afterwards fell into a sound sleep of fifteen minutes' duration, from which he awoke, expressing himself as feeling quite well, with the sole exception of a certain amount of giddiness. He was put to bed about 10 o'clock and slept till 12.30 mid-day, after which he awoke quite well, and was able to be driven home. No injurious results followed.

My principal reason for recording this interesting case is, the evidence it bears in favour of the physiologically antagonistic action lately demonstrated by Drs Bennett and M'Kendrick to be possessed by chloral hydrate over strychnia, and of its consequent value therapeutically as an antidote in cases of strychnia-poisoning. It had been previously shown by Liebreich that the antidote in cases of poisoning from hydrate of chloral was strychnia, so that we have thus two powerful poisons proved to be mutually self-destructive. In the present instance, exception cannot be taken to the efficacy of the drug as an antidote in man because it has only been tried on the lower animals; and, as this objection is often of real force and importance, it behoves the medical practitioner, in the interest of therapeutical science, to record every accident of this kind that falls within his experience. The dose taken was so small, even supposing my patient had considerably exceeded the eight drops, which he himself considered to be the very most he had taken, that fatal results could scarcely have been deemed possible, though the symptoms were distressing, severe, and even alarming. But the mitigation of these symptoms, which so markedly took place, so soon as the chloral had had time to be absorbed, and their subsequent rapid complete disappearance, though chloroform had previously failed to give more than temporary relief, prove that its beneficial action is not illusory, but real.

Besides the direct effect of the dose of strychnia taken by my patient on the morning of the 30th of January, we have doubtless present another important, perhaps the most important, element in the line of causation of symptoms, that is, the cumulative property of strychnia, when given for a length of time. Only the effects of continued use could explain the alarming symptoms arising from what could have been at most only a large medicinal dose, and not in any degree a poisonous dose, according to the ordinary acceptation of the term. The fact of the existence of this cumulative action of strychnia, combined with the great severity of symptoms, made me at first considerably apprehensive about my patient's condition, even though he assured me that the dose could not be much over eight drops.

The case, besides, affords an argument for the exercise of great caution in the administration of strychnia, so as to avoid the production of the disagreeable results of its cumulative action on the one hand, and of an overdose on the other. The system of administering powerful medicines, such as liquor arsenicalis or liquor strychniæ, either by prescribing so many drops for the patient to pour out for himself, or by having them mixed with so much water, and then measured out in such uncertain quantities as teaspoonfuls, etc., though very common, is very unscientific, and extremely dangerous. Patients requiring such medicines should be urgently recommended to provide themselves with glass measures of definite capacity, which can always be had at a trifling cost.

ARTICLE V.—*A Concise History of the Royal Infirmary, Edinburgh:* Being an Address read before the Royal Medical Society of Edinburgh, 1st Dec. 1871, by EDWARD WILLIS WAY, M.B., on being elected President.

GENTLEMEN,—Before I enter upon the subject of my address this evening, allow me to thank you most sincerely for the honourable position in which you have placed me, by electing me to preside over you. When I look back at the list of your former presidents, and see the names of so many distinguished men, I cannot but feel my own unworthiness to succeed such illustrious predecessors. But

I trust the responsibility of the post may itself prove such a stimulus to exertion, that I may, in the future, not only be no discredit to this grand old Society, but may even be able to contribute, though it may be humbly, to its reputation.

You can little appreciate, Gentlemen, the peculiar feelings experienced by a young colonist—a citizen of a new country—in coming to an old land, with its centuries of history. Before I arrived in Great Britain I had never had an opportunity of seeing buildings more than thirty years old, and even these were rare; for, of the houses erected in the early days of my colony, which were constucted of wood, not more than two or three remained when I left, and they used to be objects of veneration on account of their great antiquity. If you bear this in mind, you may understand the interest that I must feel in old places, old scenes, and old histories. Often is it that I think of these matters in regard to that great centre of medical work, the space of ground now occupied by the Royal Infirmary. I think of the old city wall built in the anxious times that followed the battle of Flodden, part of which still stands as the boundary wall of our Infirmary on the south. I think of the time when, near the site of the Medical House, or the University, stood the famous Kirk o' Field in which Darnley was so cruelly murdered. And I think of all the changes that have since intervened—the building of the Infirmary, the active medical work of the old "Surgeons' Square," with its Surgeons' Hall, now a small-pox hospital, the old High School, now part of the surgical hospital, and of the original hall of this ancient Society, now demolished. And it seems to me that I cannot do better, in my inaugural address from this chair, than give you a few results of my reading as to the place, and as to some of the men, that have been important in its history; all the more that, as the Surgeons' Hall has been transferred to a new site, as our buildings have also been removed, and as the High School is no longer what it was of old, so now the old Infirmary itself is doomed to pass away, and in a few years all will be changed.

I shall mainly speak of the development of the Infirmary. It is curious to trace its origin and earlier progress.

It appears that the city of Edinburgh, long before the foundation of the Infirmary, had contributed largely towards the support of the poor, and had appointed a *surgeon* and a *physician* to attend those labouring under any illness or accident. But the extent of the operations of this charity was somewhat limited, for only the "freemen" of the city, or, in special cases, those who had long resided within its walls, were entitled to receive benefit, so that the many hundreds who lived beyond the city bounds were left totally unprovided for.

The want of some public institution in which the poor might have their ailments attended to, and their sufferings alleviated, must have been strongly felt by persons endowed with charitable and benevolent feelings; but it was not till the year 1721 that an appeal was published, pointing out the need of such a charity, and the benefits that would accrue from its foundation. Little success, however, attended this benevolent project, and it was laid aside, happily only temporarily, for in 1725 we find the Royal College of Physicians—be it said to the honour of that body—again bringing the matter before the public. At that time the Scottish Fishery Company was about to be dissolved, and the College of Physicians, obtaining from them a considerable portion of their stock for the purpose of founding an infirmary for the sick, at once started a subscription, heading the list themselves, at the same time engaging to attend the patients without any remuneration. The College of Surgeons joined most heartily in the undertaking. The subscriptions flowed in freely, and as a further inducement for people to give, it was made a condition that the sum of £2000 should be raised before a certain day; but, owing to the zeal and activity displayed by those engaged in promoting this noble work, that sum was exceeded long before the time. A meeting of the subscribers was now called by the College of Physicians, and the contributors thus assembled nominated twelve of their number to further the object under consideration, and to prepare a plan for the erection of an infirmary. A petition was also laid before the Assembly of the Church of Scotland, asking that subscriptions might be collected in all its churches, and, according to Maitland, in his "History of Edinburgh," "the contribution was earnestly and strenuously recommended by the Assembly in their Act of the 11th May 1728, and a copy thereof sent to the incumbents of the several parishes throughout Scotland; yet such was the amazing indolence, laziness, and obduration of the said incumbents, to their eternal reproach, that though this great and pious design was calculated for the relief and benefit of the greatest and most moving objects upon earth, few of them concerned themselves in this truly good and Christian work."

Notwithstanding this want of sympathy on the part of the clergy, money was sent from all quarters, and in 1728 another meeting of the contributors was called, at which it was determined to open at once a temporary hospital. Accordingly, a small house was taken and prepared for the reception of patients; and at the end of one year I find the total number of patients admitted amounted to 35, of whom 19 were cured, 5 were dismissed in process of cure, 5 discharged as incurable or for irregularities, and 5 remained in the house, there being only *one* death. Whether a post-mortem examination was made on this case or not, I have no means of ascertaining, but it is to be hoped that the most was made of this solitary opportunity of acquiring practical pathological information. The working of this temporary hospital seems to have given great satisfaction—the low death-rate in the first year possibly contributing towards it!—and the funds in hand went on increasing till, in the year 1738, they amounted to £5000, when the foundation-stone of the eastern end of the building now known as the Medical House was laid. Two years previously a royal charter was granted, since which time the institution has been known as the "Royal Infirmary of Edinburgh." The first intention of the contributors was to erect only the eastern half of the building; but the encouragement they had received induced them, on the completion of this portion (which was opened to patients in 1741), to proceed at once with the building of the remainder, and accordingly the whole house was completed in 1745. There are two names which are inseparably connected with the birth and infancy of our Infirmary. You must all have noticed, in the vestibule of the Infirmary, a bust, and below it you will find this inscription, written by the historian Robertson,—"George Drummond, to whom this country is indebted for all the benefits which it derives from the Royal Infirmary."

George Drummond was particularly energetic in the foundation of the institution; he subscribed largely himself, and laboured unceasingly to induce others to do the same. But this was not all; we find him engaged actively in superintending the building operations. In Bower's "History of the University of Edinburgh," I find the following, which I consider worth extracting:—

"Messrs Drummond and Monro were appointed the 'building committee.' The money contributed, and with which the work was begun, was soon expended, but perhaps the alacrity and hearty co-operation with which this laudable enterprise was carried on, is without a parallel in the history of any charitable foundation. Materials for the building, of every description, were contributed in small quantities by those who had it not in their power to advance money; and even the common workmen rivalled each other in frequently giving their labour gratis; and, instead of repining, cheerfully submitted to the inconvenience they suffered from their wages being sometimes not regularly paid, such confidence had they in common with all ranks in the talents, integrity, and generosity of these two gentlemen. They uniformly paid the workmen themselves, and permitted no avocation whatever to interfere with what they esteemed so imperious a duty; and their presence, combined with their engaging manners to all employed about the work, had the effect of accelerating its progress in the most remarkable manner."

But we, as students in this University, have cause to revere the memory of Drummond for other benefits besides those which we enjoy from the practice of the Infirmary. It was he who was instrumental in the establishment of five of our professorships, four of these being in the Medical Faculty, viz., those of Chemistry, Theory of Physic (now called the Institutes of Medicine), the Practice of Physic, and Midwifery, the fifth being that of Rhetoric and English Literature. Besides those we have already seen, his many labours for the improvement of this city are too numerous for me to mention. I cannot, however, refrain from pointing out that the grand addition to this city, made by the building of the New Town, was due chiefly to his exertions. Somerville, in his "Life and Times," narrates a circumstance bearing on this point worth quoting; they were standing at a window overlooking the North Loch (now known as Princes Street Gardens), beyond which were the fields called Barefoot's Parks (now the New Town). "Look at these fields," said Provost Drummond; "you, Mr Somerville, are a young man, and may probably live, though I will not, to see all these fields covered with houses forming a splendid and magnificent city. To the accomplishment of this nothing more is necessary than draining the North Loch, and providing a proper access from the Old Town. I have never lost sight of this object since the year 1725, when I was first elected Provost. I have met with much opposition, and encountered many difficulties which have retarded success, but I believe that they are at last surmounted, and that this great work will soon be carried into effect." How fully indeed have these utterances been verified!

Drummond's great coadjutor was the famous Alexander Monro *primus*. We shall speak afterwards of this illustrious man.

When the hospital was open for the reception of patients, the Managers very wisely—foreseeing the advantages to be derived from the admission of the students to the practice of the hospital, not merely for the purpose of improving their education, but as a substantial means of increasing the revenue of the institution—permitted them free access on the payment of moderate fees; and it was not very long after, that the system of clinical lectures was introduced. The honour of this advance in medical teaching appears to be due to Dr John Rutherford (the grandfather—through his daughter, Anne Rutherford—of Sir Walter Scott), who was at that time Professor of the Practice of Physic. The history of our Society informs us that, before this, he had encouraged his pupils to bring patients to him on Saturday, when, after inquiring into their complaints, he prescribed for them in the presence of his class. Appreciating the success that resulted from this method of instruction, he suggested to the Managers that they should allow him to give clinical lectures in the Infirmary; and they not only approved of the suggestion, but placed two of their wards at his disposal, for such cases as might prove interesting and instructive from a clinical point of view. This was the origin of our "clinical wards" and "clinical lectures," which, therefore, date from 1748. The next year, the Managers extended the privilege of giving these lectures to the other medical professors; and it was then that Monro introduced this mode of teaching into the surgical department. Monro laboured most zealously to forward the education of his pupils, and the fame of this University is, in great measure, due to his energy in the cause of science. We have already seen how actively he was engaged in the building of the Infirmary,—we now not only find him, as the Professor of Anatomy, teaching with the greatest success, and thus attracting to this University students from all parts of the world, but we also see him, though engaged as a professor, as a manager, as a surgeon, as a clinical lecturer, yet finding time to unfold to his hearers the treasures of his pathological experience. We are told that "he personally attended the opening of every body, and not only dictated an accurate report of the dissection, but, with nice discrimination, contrasted the diseased and sound state of every organ."

You must pardon me if I introduce to your notice another great man, intimately connected with the Infirmary in the capacity of a clinical professor. I allude to William Cullen. You will remember that, in the year 1748, permission was granted to the medical professors to deliver clinical lectures; but only Monro and Rutherford appear to have availed themselves of the privilege. But, as soon as Cullen was appointed Professor of Chemistry, he began also to deliver a clinical course, and he soon acquired a great reputation in this branch of medical teaching. He also appears to have taken an unusual interest in his pupils, employing every means to become personally acquainted with them, and, in many cases, acting towards them with the greatest kindness. Dr Aiken, a pupil of Cullen's, remarks,—"He was cordially attentive to their interests, admitted them freely to his house, conversed with them on the most familiar terms, solved their doubts and difficulties, gave them the use of his library, and in every way treated them with the respect of a friend and the regard of a parent." I must not omit another point, which ought to induce us to respect his memory, and that is,—it was he who introduced the generous principle of refusing fees from students for attendance in their illnesses: he would never receive a fee in such a case, and his example has ever since been followed by his successors. During the first few years of the existence of the Infirmary, the number of beds occupied amounted to about 40, but, as funds accumulated, this number was increased soon after to 60, and in 1770 to 80; besides which, beds were allotted to soldiers, who were paid for by the Government, and to servant-girls, for whom a ward—now known as No. XII.—had been furnished by a public subscription in 1755, thus making altogether about 130 or 140 beds. Three or four years later, the other wards were furnished, and the number of beds then occupied was about 200. In the earlier days the resident medical staff consisted of one clerk. Amongst other duties, he had to take reports of the cases. This was done in a journal which used to be moved about the wards on castors during the visit of the physician. The method of case-taking was peculiar, and is well reported in a letter quoted by Maitland. It says:—"Each page of the journal was divided into seventeen columns, containing a diary of the cases of the several patients, and various appearances of their distempers while under cure, the names whereof are placed at the heads of the several columns, as followeth: The 1st contains the dates of the year, month, and day; the 2d the number of the bed wherein the patient lies; 3d, operation of the medicines; 4th, intervening symptoms; 5th, pulse; 6th, thirst; 7th, appetite; 8th, spittle; 9th, tongue; 10th, sweat; 11th, urine; 12th, fæces; 13th, ordinary symptoms; 14th, supervening symptoms; 15th, food; 16th, drink; 17th, medicines."

There was also a ledger, in which every case had one or more pages allotted to it. In this the clerk had to enter an exact description of the patient's case, dictated to him by the physician, and to this to add the daily reports taken in the journal. The students used to hear and see all the cases examined by the physician; but, in addition to this, "once a week the whole practice of the hospital is read leisurely by the clerk to the whole of the students in the operating-room, to give them an opportunity of taking notes of every cure they think worth while; and, further, he hath orders to give them full copies of every cure they call for, upon their paying a trifle for writing it out for them." So that the office of clerk, or what we now dignify by the name of resident-physician, in those days appears to have been no sinecure.

Here is an old regulation affecting the students:—"Students who attend the physicians during their prescriptions are to study a composed and decent carriage; are not then to stroll about in the wards, converse together, stand upon benches, beds, or do anything that may be disturbing to the physician, clerk, or patients."

It appears that the matron, in the absence of the surgeon, was instructed to admit patients,—a regulation which, in these days of female doctors, might probably, in the event of a vacancy, cause a medical education to be a recommendation.

I find it was in the year 1751 that the first ordinary physicians were appointed. These were Dr David Clerk and Dr Colin Drummond, and each of these received a salary of £30 per annum—a sum afterwards increased to £70—for their services. Before this, the Fellows of the Royal College of Physicians in rotation had regularly visited the medical cases, except those in the clinical wards. About fourteen years later, four ordinary surgeons were similarly appointed, to have entire charge of the surgical department, which was confined to the wards on the third floor, the two western ones of which, as Dr Grainger Stewart's resident-physician, I lately had the charge. The ward now known as No. XVIII. was then the operating theatre. The wards on the second and third floors were devoted to medical cases; and in the attic was a small one for females called the "salivating ward," the use of which is too obvious to demand explanation; and another was used as a maternity hospital.

You have doubtless all noticed the cells leading into the passages on the ground floor. These were originally built for the reception of lunatics, but on the opening of the Morningside Asylum their use was no longer necessary. The foundation of that Asylum was chiefly due to the instrumentality of a former member of this Society, who presided for six sessions at its meetings,—Andrew Duncan, senior, a distinguished Professor in the University, who worked enthusiastically in behalf of our Society, and who, we are told, never hesitated to declare that he considered it an essential part of the Medical School of Edinburgh. The building of our old Hall in Surgeons' Square was in great part due to his zeal and exertions. Before this was erected, our Society used, from its earliest days, to meet in two rooms placed at its disposal by the liberality of the Managers of the Infirmary. The expense thus saved permitted the accumulation of a considerable library, which has steadily gone on increasing, and is now one of the finest medical libraries in the world.

Thus, Gentlemen, have I for a few moments lifted up the dark veil of the past, and given you an insight into the earliest times of our Infirmary. It would be easy for me to go on,—the past hundred years is rich in medical history,—but time will not permit. It is wonderful, though, to think how the fame of the work done in that little patch of ground occupied by the Infirmary has sounded through the world. In Australia I learned to venerate the School of Medicine of Edinburgh. When I went to Guy's Hospital and entered upon my studies within its historic walls, I still felt that higher traditions clung about the grand old School of the North; and when at length I came hither, I saw an earnestness of work and a thoroughness of teaching which made me feel that the ancient reputation was not to be dimmed by the work of to-day. And, let me add, not the least among the attractions of this School I found this venerable Society, with its noble hall, its magnificent library, and, above all, its roll containing so many illustrious names. Happy did I feel when you permitted me to inscribe my name as member; and need I say, Gentlemen, that I esteem it the proudest honour of my life to be its President.

ARTICLE VI.—*Notes of a Case of Ligature of the Subclavian Artery under somewhat unusual Circumstances.* By JOSEPH BELL, F.R.C.S.

(*Read before the Medico-Chirurgical Society of Edinburgh*, 21*st February* 1871.)

ON the 5th of June 1871, I was asked by my friend, Dr George Leith of Comrie, to see with him a young woman, æt. 24, who had a deep-seated abscess in her axilla and in front of chest. Dr Leith suspected dead bone, so asked me to come prepared to remove it if necessary.

State of Patient.—Patient was in a state of advanced hectic, lying on her back, sunk down in the bed, sweating profusely, and with a harsh, dry tongue, and a very feeble pulse, over 120, quick and thready. She was in the last stage of anæmia; the lips almost colourless, and cheeks white, with a faint red spot. An excessively fetid and profuse sero-sanguineous discharge, soaking the bed-clothes, was oozing from several small apertures in the axilla and below edge of pectoralis major of left side. One large purple spot below centre of left clavicle showed where the skin was strained and on the point of bursting. The left arm was firmly held to the side, from which she had not allowed it to be moved for some weeks, partly from a dread of pain, but chiefly from a feeling of which she told us, that something would burst if she was made to move it. The muscles in front of axilla were stiff and fixed. She was excessively timid, and could not bear the slightest movement of the bed, or allow us to examine her in any way before she was put under chloroform.

History.—Early in the spring she suffered from a poisoned wound of one of the fingers of the left hand, and, in connexion with this, an abscess (probably in its origin glandular) formed in the axilla of the same side. This burrowed most extensively below the fascia, but especially upwards in the direction of the clavicle. The abscess was opened by Dr Leith on the 25th of March, and about two tea-spoonfuls of pus evacuated. After considerable discharge, aided by poulticing, the wound began to heal up, but deep-seated suppuration continued to burrow in all directions, with no tendency to healing of the deeper parts. After this, Dr Gairdner of Crieff saw her in consultation, when hectic was beginning to show itself. He inserted tents into the sinuses, in the hope of enlarging them and giving more free vent to the discharge. This had the desired effect, but no tendency to dry up manifested itself; the constitution, never very strong, was fairly sapped; the profuse discharge being aided by night sweats, a high degree of fever, want of appetite and sleep. A still more alarming symptom had begun about a fortnight before I saw her, in the appearance of arterial hæmorrhage, in small quantity, but quite distinctly arterial, every time the wound was dressed.

On seeing the condition and hearing the history, I must say I felt almost hopeless of any good result in interference with the case, but determined to probe the wounds to find if any necrosed bone from the ribs or disease of the shoulder-joint could explain and account for the symptoms. This, however, she could not stand without chloroform, which Dr Leith administered. When she was fairly under, we raised her very gently from the hollow in which she was lying, and got her to the edge of the bed, and pulled the bed to the window, which, fortunately, gave a most excellent light. The mere movement was at once followed by smart arterial hæmorrhage from all the wounds, florid blood in full jets—not mere oozing, but distinct jets nearly an inch in height. This induced me to lay out everything necessary to tie a considerable vessel, fortunately including an aneurism-needle. I then introduced a probe into the lower wound; the arterial hæmorrhage increased, and it became still more marked when Dr Leith raised the arm slightly from its cramped position close to the side. Getting her fully under chloroform, I passed a probe-pointed bistoury into the lower sinus just under the edge of the pectoralis major, and enlarged it sufficiently to admit my forefinger, trusting by it to discover whence the bleeding proceeded, and to find out the condition of the ribs. The hollow was full of fresh warm blood coming from above, and the upper purple thin skin was becoming actually distended by it. It was obvious that, if we wished to save the patient's life, and escape the credit of killing her, though as yet we had done nothing but raise her arm and probe the wound, we must not delay. I, with Dr Leith's concurrence, with a free incision divided, first, the skin over the pectoralis major, then the muscle itself, and then the pectoralis minor, exposing the whole course of the artery. This was done with great rapidity and ease, as the muscles had been fairly dissected out already by the suppuration, and retracted with great rapidity as the knife cut the tense and stretched fibres. I now had a great gaping wound from the clavicle to the posterior fold of axilla, and saw the source of the bleeding at once in a rent in the subclavian artery itself, about as large as a threepenny-piece. This had evidently been a mere slit with ragged edges at first when the arm lay at the side, but the movement of the patient, and particularly the raising of the arm, had made the slit into a great transverse gash, from which the blood was pouring in a most terrifying stream. Of course, my left forefinger was at once on the wound whenever it was seen, and I was glad to find that, by forcing the shoulder upwards, which was now quite easy after division of the muscles, that I could completely arrest the bleeding by pressing against the first rib.

We had now time to look about us; we had no one in the room to help; so while I still held the vessel, first Dr Leith gave the patient a little more chloroform to ensure her stillness, then we washed all our sponges, got clean water, etc. He then handed me a scalpel, with which I cleared the vessel above the wound and above the clavicle, and easily passed a strong catgut ligature round it by the aneurism-needle. This, when tied, diminished the flow of blood, but did not control it till I again cleared the vessel below the aperture, which was quite easy from the free access we had to it, and passed another ligature, which, when secured, completely controlled the hæmorrhage; we then tied all the other bleeding points—which were not very numerous, from the patient's weak state—washed out the wound with a solution of carbolic acid, stitched up the larger part of the incision, inserted a plug in the lower angle of carbolic gauze soaked in oil, and fastened it all up with a pad of carbolic gauze, twelve layers, and a firm spica bandage.

By this time she had come out of the chloroform, and was wonderfully well. We saw her again in an hour; her pulse had begun to rally. I did not see my patient again, having to leave for Edinburgh, but had a letter from Dr Leith, detailing the future progress of the case, which I have most unfortunately mislaid. The gist of it was, that excessive sero-purulent discharge continued, that for a few days she seemed to rally, and to have less hectic, but that eventually she died exhausted, about a week after the operation.

Remarks.—The unfavourable result in this case was not to be wondered at; indeed, any other would have been almost impossible to expect, for from the condition the patient was in, no sane man would have attempted any such operation, could he have helped it; but, under the circumstances, I was simply compelled to perform this serious operation, or else lose the patient from immediate hæmorrhage. This hæmorrhage might have occurred at any moment during the weeks before the operation, or the days after our visit; it could not have been delayed long; but as it did coincide with our visit, we certainly would have got the credit of it, though our part in inducing it was simply moving the patient in the bed, not even out of the bed, as it had begun before Dr Leith even touched her arm.

Was there any other course to pursue, had we known the exact state of affairs? I think not, except not to have gone to see the patient at all; for no other operation would have done any good. Ligature of the third part of the subclavian in the usual way would not have sufficed, as the large gaping wound, the result of ulceration, would have bled from recurrent circulation, and did do so even after the artery was tied. I do not wish to magnify the difficulties of the operation, but I do not think an operation of such importance has been often done with so little assistance. One to give chloroform, hand instruments, wash sponges, etc., is little enough; and I allude to this merely to express in the strongest terms my sense of the admirable coolness, tact, and skill, displayed by Dr Leith in his very difficult task of being house-surgeon, clerk, and dresser all at once. The case has some important practical lessons to teach. 1. Not to leave abscesses in this region too long unopened. In this case, the fears and timidity of the patient and her friends were the cause. 2. To be exceedingly cautious in moving limbs which have been long stiff, where suppuration has been long going on near a great vessel. 3. Never to begin any procedure, however slight, even probing of a wound, without having your aneurism-needle at hand.

ARTICLE VII.—*Cases from Practice, with Clinical Remarks.* By Staff-Assistant-Surgeon W. CURRAN.

THE following cases, which occurred in my own practice, within a comparatively short time of each other, and at a period of unusual fatality in the 88th Regiment, are selected as being in themselves typical instances of the diseases they are intended to represent, and which they serve to illustrate; and the pathological conditions brought to light through them are such as will, it is hoped, warrant their publication. Having at hand no other than common manuals of old date to refer to for information respecting them, I think it better to abstain from scientific criticism or comment of every kind, and leave them in their unadorned nakedness to speak for themselves. I will, however, throw in, under the head of remarks, such general reflections as their individual characteristics may appear to call for, or as their collateral bearings may obviously suggest; and for the rest, I am willing to trust their interpretation to the courtesy of my readers. I offer them as an instalment of what I would wish to do in the same direction hereafter, should suitable material offer, and as an evidence in support of an impression I have long entertained, to the effect that, in spite of its general monotony, military medical practice is often quite as interesting, and sometimes even more varied, than its counterpart in civil life.

CASE I.—*Aneurism of the Aorta opening into the Trachea.*—No. 1341, Private J. Johnstone, age 34, has completed ten years' service, upwards of eight of which have been passed in India, and his habits are said to be regular and temperate. He is a person of a sanguine temperament and well-favoured complexion, and there is no tendency on his part to syphilitic or other hereditary disease. He has rarely complained of illness since he joined the service; his face is cheerful and indicative of contentment, and his general appearance bespeaks the possession of health.

When admitted to hospital on the 17th of October 1869, with bronchitis, his right lung was so seriously implicated as to be almost entirely impervious to the access of air, and his breathing was everywhere noisy, wheezing, and embarrassed. In spite of this, however, he looked well, he did not hawk up phlegm, or cough with unusual severity, and he stood up without any apparent effort near his bed on my approach. As judged by his manner and appearance, he might have been admitted for the most trivial ailment, and he certainly did not complain of any unusual difficulty or distress in connexion with the chest. He appeared, in fact, to make light of his complaint, and regarded as exaggerated the interest and anxiety his case excited in me; he sat up in bed notwithstanding my orders to the contrary, as soon as my back was turned on him, and he submitted, as I subsequently learned, with no little reluctance to the restraint and regimen I thought it necessary to prescribe for him. Indeed, his whole appearance so imposed on me, and the lung symptoms were so much in excess of all others, that I did not myself fully realize the gravity of his state

I confined my attention exclusively to the chest, and felt no misgiving as to the result. The surgeon who admitted him noticed a peculiar muffled throbbing in connexion with the heart, which gave rise in his mind to a suspicion of aneurism; and though this circumstance was mentioned to me, yet the chest symptoms so masked the sounds of that organ, or concentrated all notice on themselves, that my thoughts were directed from it at the time, and the treatment subsequently put in force, as well as the unexpected termination of the case, precluded all further investigation during life; I thought, in fact, that there would be time enough to examine the heart after the lung derangement had been provided for, and I directed my treatment and thoughts accordingly. The expectoration, which was at first patchy and nummulated, became, soon after he came under my notice, copious and aeriform; it was expelled with ease, but was never quite free from stains of red arterial blood. The breathing was, as I said before, everywhere noisy, wheezing, and bronchial; the chest did not expand as it ought with deep inspiration; and the presence of snoring and sibilus near apex, and of moist râles (the liquid bubbling rhonchus of Walshe) towards the base, entirely filled the ear, and completely removed every trace of healthy respiration. He was allowed 6 oz. of wine, the right side was freely cupped, and a blister was placed on the sternum. He had also a purge and a mixture, containing prussic acid and tartarized antimony, and turpentine stupes were applied by way of derivative to the back. Under this treatment, aided by rest in the recumbent posture, and the steam of hot water in which camphor had been dissolved, his chest complication improved, and he was so much better on the morning of the 21st, that he got up soon after my visit, and strolled about enjoying his pipe in the outer verandah of the hospital. Returning to the ward, he lay down to rest, and was soon afterwards seized with a hæmorrhage, estimated at several quarts, which proved instantaneously fatal. The conditions under which this took place, are detailed in full below.

Post-mortem examination seven hours after death.—Body well nourished and free from rigidity; there was no appearance of injury or discoloration anywhere; and the nares and moustaches were only slightly streaked with blood.

Head not examined. Chest: On removing the sternum, which was found to be somewhat denuded of periosteum on the under surface, a large, bulging, globular mass was seen occupying arch of aorta, in its transverse portion, somewhat to right of mesial line, pressing on right lung, and by its bulk filling up the interval between base of heart and outlet of chest on its anterior aspect. This consisted of a diffuse aneurism, whose sac was formed by the cellular tissue of the anterior and middle mediastinum and lining membrane of right lung, to which it adhered so closely, that separation could only be effected with difficulty, and which contained upwards of one ounce of dark semi-organized fibrine that was copiously tinged with blood. It was entirely external to the channel of the artery, with which, however, it communicated freely through an opening, with thickened and indurated margins, and it had eaten its way, by ulceration, into the trachea, just above the right bronchus, and between that tube and its fellow of the opposite side. The opening into the trachea appeared to be of recent origin, and about an inch in length. It involved some four rings of cartilage, and through it the bleeding took place which proved so rapidly fatal. The cavity of the arch was enlarged and dilated, and its surface was puckered and covered with patches of atheroma. The heart itself was loaded with fat; it had a soft, sodden feel, from contact with the pericardial fluid by which it was surrounded. Its muscular structure appeared pale on section, and there was some hypertrophy of its substance on the left side.

Lungs: Right, consolidated towards the apex, by the pressure exercised upon it by the mass described above, and congested towards the base, where also there was a slight patch of pneumonic infiltration. It weighed 1 lb. 4 oz. The left was structurally healthy, weighing only 15 oz.; and the other organs did not call for examination.

Remarks.—These need not detain us long, as the particulars given above speak plainly enough for themselves, and leave no doubt as to the nature of the case. I have learned, since this man's death, that, when stationed at Delhi in 1859, he fell down a well, from which, however, he was rescued in a condition and under circumstances which gave rise to no suspicion of his having, at the time, sustained any serious injury. While his comrades were drawing him up, the rope broke, and he fell back again into the pit from which he had been just extricated. While in the act of falling, one of his companions, whether sober or not at the time does not now appear, impelled by that strange and ill-regulated ardour which so frequently seizes soldiers, jumped down after or upon him, and alighted on his shoulders. Of course, the result which this would-be helper wished to obviate, was by his own very act greatly accelerated, and of course also the momentum of this poor fellow's fall was thereby increased tenfold. Whether the rupture that ultimately led to the terrible complication described above took place at that time or not, cannot now be determined, as there is no account of the circumstances available, and there is no one at hand capable of enlightening me further on the point. I think it highly probable, however, that such was the case, and if so, the kindness, not to call it capacity and skill, with which Nature "ever kindly bent to ease us," economizes her resources, and adapts herself to the wants and weaknesses of her subjects, will become more striking than ever. I cannot learn that this man ever complained of shortness of breath, aphonia, giddiness, or any of those other common complications that point to or usually accompany aneurism of the aorta; but the character of the lesion, as described above, may in some measure account for this; and anyhow, his good health and immunity from suffering are, under the circumstances, calculated to create surprise. In this respect, and so far, the case is highly significant. Ulceration of cartilage in the neighbourhood referred to, must be very rare, and I have myself never seen or heard of a case in which an aneurism of the aorta discharged itself through a rent in the trachea.[1]

CASE II.—*Enteritis.*—No. 4769, Private P. Walsh, age 34, service fifteen years, twelve of which have been passed in India; is a man of good conduct and temperate habits, who has generally enjoyed fair health. He suffered a good deal from ague during the summer, and appears to have been much debilitated thereby, but he appeared to regain some of his lost ground since the cold weather set in, and there is no history of syphilis in his case. When brought to hospital about 1 P.M. on the 15th November, he was greatly prostrated from purging and vomiting, and he could scarcely retain any food or physic on his stomach. He was almost pulseless, and could only speak in a low whispering voice, and his breath and body were cold to the feeling and touch. On further inquiry, it appears that soon after rising this morning, and while in the act of performing his ordinary ablutions, he was suddenly seized with an uncontrollable desire to go to stool, and when there, he passed a very copious liquid motion, which came from him, as he forcibly adds, "like a dash of cold water." He subsequently voided others of similar character and consistence, and when seen by me soon after admission, his condition appeared to verge on collapse. The pulse, extremely small, and not always distinguishable, was at best feeble, thready, and flickering, and was soon entirely lost; the voice was husky and indistinct; and the expression indicated great suffering and depression. The surface, though by this time fairly warm, was corrugated and sticky; he complained of an insatiable thirst; said he was troubled with cramps in the legs and pain in the belly; and he passed from time to time a fluid which, under the microscope, was freely stained with blood, and which appeared to contain shreds of mucus, some few oil globules, and more numerous flakes of cylindrical epithelium. It was indeed, to all outward appearance, a case of cholera, but some of the more pathognomonic symptoms of that disease were entirely absent, and, as will hereafter appear, the post-mortem appearances were altogether different. He had been properly allowed some brandy before my arrival, which I ordered to be continued; and as his weakness increased and his stomach became more irritable, I had it replaced or supplemented by champagne. Mustard poultices were applied to the abdomen and epigastrium, and the legs were shampooed to remove or relieve cramps. A hot bath subsequently employed, appeared to soothe him for a while. Cold beef-tea was allowed *ad libitum*, and the thirst was mitigated by the use of lime-juice, champagne, and soda water. Enemata of ipecacuanha and gallic acid, which were given at the instance of Surgeon Fraser, afforded only partial relief, and they entirely failed to check the bloody discharge from the bowels. On the 16th, he was described as no better; and though carefully tended all night, and supplied at frequent intervals with such support as he relished or could retain, he yet was clearly weaker, and every trace of an attempt at reaction had passed away. Bloody serum, of a singularly fetid odour, continued to escape from the bowels, and the attendants complained of the horrible stench of sulphuretted hydrogen the body itself gave out. He still complained of pain in the belly, but was quite free from cramps; the voice was weaker and more suppressed than on the previous day, and he feebly told myself, that he fancied there was nothing at all inside in him. He began to lose ground soon after 10, and died quietly of exhaustion about 11 A.M. of same date.

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[1] I have recently come across cases of the kind here contemplated in the Transactions of the London Hospital, and also in Trousseau's great work on Clinical Medicine, vol. i. p. 596; but I am not aware of any others, and they must, I think, be at least very rare.

Post-mortem examination five hours after death.—Body fairly nourished and almost free from rigidity. Head not examined. Chest: Lungs structurally healthy, but loosely adherent on right side. Heart, dense in structure, heavy to the feel, and but sparingly lined with fat, weighed 12 oz., and was otherwise healthy. Large masses of fibrine escaped from its outlets on division, and the blood was everywhere thin and watery.

Abdomen: Liver soft, friable, and pale on section, weighed 4 lbs. 2 oz., and the gall-bladder was full of dark tarry bile; the stomach and intestines were greatly distended and tympanitic, of a dusky livid colour superficially, and almost entirely denuded of peritoneum; the former was pale in its interior, but the latter were throughout deeply injected, and the smaller bowel contained a large quantity of a dark inodorous fluid, which emitted no smell of fæces. The large intestine more congested than its neighbour, especially so near cæcum, where the injection assumed the dark hue of threatening sphacelus, gave evidence, on its free surface, of extensive shedding and desquamation of the mucous membrane and epithelium, which in some places resembled ulceration, while elsewhere the appearances varied between the vesicular eruption of smallpox, and the rough streaky mottling of scurvy. Similar though less developed conditions were found in the small intestines; the calibre of each was increased, and the power of absorption must have ceased in both some time before death.

Spleen soft in texture, of a deep purple colour on section, and looking like currant-jelly, weighed 1 lb. 5 oz. The kidneys appeared unaffected, and the bladder was collapsed and healthy.

Remarks.—This case, which might be roughly described as a cross between cholera and enteritis, was, as any one capable of weighing the evidence of symptoms, or judging the significance of minute pathological changes, will at once allow, neither one nor the other, though I, in my ignorance, ascribed it to the latter; I knew no better then, and know no better now; and I have not been able to find anything like it in any of the books to which I have had access. I have looked in vain for a parallel to it in the standard works of Martin and Morehead,[1] and there can scarcely be a doubt that it is an instance of a disease *sui generis*, which was due to local influences, and for whose specific designation the new nosology makes no adequate provision. It was a result of that terrible malaria which is so peculiar to and so prevalent in the valley of Peshawur, which so often tends to complicate there the course of cases that would scarcely require serious notice elsewhere, and against whose powerful spell the strongest constitution is not always the best security. Any one acquainted with the modifications of fever produced by this poison in the great valley beyond the Indus, will readily acknowledge its general resemblance to some of the cases he must have seen, and yet there are features attaching to this which are not common even there. Among these, the more striking are, the sudden accession of urgent diarrhœa and sinking, the escape of bloody serum containing masses of oil and mucus, the absence of the pathognomonic discharges of cholera, or of the more pronounced symptoms of enteritis, and yet withal a general resemblance to both, the feeling of emptiness within, and the absence of pain on pressure over the abdomen (while the poor man expressed himself as suffering severely all the while), the intensely fetid odour of the surface, the thirst, pinched face, sunken expression, and suppressed voice, and finally, the cramps, collapse, and post-mortem appearances,—all these formed a *tout ensemble* such as I have never witnessed before, they puzzled my experienced colleague at the time, and determined myself to put them on record in this place; and I have now no doubt at all, that they were due to those peculiar atmospheric or telluric agencies which caused such havoc in the Peshawur district last season. This impression derives additional support from the fact, that some six other cases of the same kind occurred in the regiment about the same time, all of which, however, recovered; and as if to show how searching and impartial they can be, no less than ten children were attacked with convulsions in barracks, within as many days of the date given above. Cholera raged about the same period at Peshawur, and judging by my own observation as well as from the reports of friends, I can, I think, venture to say, that the utterly hopeless and intractable character it assumed there at that time, was due to the same cause.

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[1] Looking, in view to the case here described, over the able work of this gentleman, which, I may be permitted to say, I consider to be the best guide to the diagnosis and treatment of disease, as it appears in India, hitherto published, I came across the following passage:—"In sthenic Europeans, this form of fever (intermittent, complicated with jaundice, etc.) is very rarely attended with diarrhœa or dysentery," and said at once, This man could never have served in the great valley beyond the Indus. For though strictly pertinent as regards other parts of India, it is quite incorrect when applied to the type of fever that prevails at Peshawur, where diarrhœa, often profuse, sometimes bloody, and always exhausting, is a common accessory.

Case III.—*Sanguineous Apoplexy.*—Rose Anne Neill, age 26, mother of three children, of healthy but anæmic complexion, was admitted to hospital at Nowshera, in the afternoon of 6th December, with a hot skin, anorexia, thirst, wakefulness, and general malaise; she complained of having spat up some blood in barracks, which was supposed at the time to have come from the throat or fauces, and she was also troubled with nausea, and inclined to vomit, when first seen. When visited by me in the evening, she complained of great uneasiness, not amounting, however, to actual pain, in the forehead and temples; she rolled her head from side to side fretfully, and appeared unwilling to answer questions or be otherwise disturbed. Influenced by her anæmic, pasty appearance, and taking into account that she had suckled her last child for upwards of sixteen months, I ascribed these symptoms to debility, aggravated by the effects of malaria on an enfeebled frame, and ordered her at once some port wine and arrowroot. I left, after having prescribed three leeches to either temple, the application of cold to her head, and the use of half a grain of morphia at bed-time. In the meantime she was to be left alone, and allowed lime-juice and soda-water as a beverage. When summoned to see her again, some three hours afterwards, I found her lying on her back, pulseless and insensible; and the subordinate on duty assured me that he found her in the same condition a short time previously, and that there was not, from the beginning, any appearance of spasm or convulsion about her. I noticed that her breathing was quickened and somewhat embarrassed, that she sighed feebly at times, that the pupils were contracted and almost insensible to the stimulus of light, and the heart's sounds could scarcely be heard at all in consequence of her noisy, jerking, and bronchitic respiration; and having had the misfortune of seeing, some years ago, a case of poisoning by morphia in the person of a woman aged 36, the mother of several children, which bore a striking resemblance to this, I at once suspected a similar complication in the present instance, and was agitated and annoyed accordingly. There was, however, no time for speculation or comparison; the breathing, embarrassed from an early period, had now become raucous and catchy, and nothing but râles could be heard in the chest, and mucus was clearly accumulating in the air-passages. Brandy had been properly given before my arrival; this was ordered to be continued, and was subsequently supplemented by champagne, but she made no attempt at swallowing either, and their exhibition caused a good deal of resistance and distress. Irritants of various kinds, including mustard, liq. lyttæ, liq. ammon. fort., etc., were applied over the abdomen, chest, and calves of the legs, on the neck and behind the ears, and a turpentine and assafœtida injection was exhibited per anum. But no material change was brought about, and even galvanism failed to make any lasting impression. Under these circumstances, and before the case should become entirely desperate, I sent for my senior colleague, Surgeon Fraser, who only slightly modified the treatment above described, or varied it a little by the addition of other stock remedies, and who subsequently gave me the following note of the appearances witnessed by him:—"The pupils had begun to dilate when I saw her, and they appeared to have lost all sensibility to outward stimulation. That part of the surface which was exposed to the air was pale and cold, the tongue and breath were also cold, and the body itself was slightly bedewed with moisture. The wrists and fingers were spasmodically contracted, the thumbs were flexed inwards, and the voluntary muscles could not be induced to uphold or sustain the body in any fixed position." Meanwhile our intelligent apothecary, noticing my great anxiety, and fearing lest his subordinate might be compromised by the result, took him aside, and after impressing on him the gravity of the case, and suggesting the propriety of a candid confession of his error (it seemed to be taken for granted that he exceeded his orders), asked him plainly to state how much morphia he had given her, and thereby obviate the necessity for, or anticipate the consequences of, an investigation. He acknowledged at once that he had not carried out my orders, or given her any medicine at all, and that when he came to administer the dose he found her in the condition already described. This declaration, although it afforded me some relief, did not altogether remove my anxiety, and hoping almost against hope I continued to persevere with such remedies as I thought likely to be of use under the circumstances. These, however, did no good. On the contrary, by increasing the frequency of the respirations and encouraging the struggles of the patient, they tended to exhaust her remaining strength and precipitate the result. Seeing this, I soon discontinued them altogether, and she died quietly and without any appearance of spasm or convulsion, about 2 A.M. of the 7th, some six or eight hours after her first seizure. The appearances disclosed by the examination detailed below, will fully account for the sudden supervention of insensibility, and show that my suspicions were ill founded, and my diagnosis at fault.

Post-mortem examination ten hours after death.—Body was fairly nourished, and the head only was examined. On removing the calvarium the dura mater was found tense and prominent, of a dark-blue colour, inclining to black, and its superficial vessels were enlarged and swollen. This colour was due to the presence of a large quantity of dark venous blood which lay on the surface of the brain and invested that organ like a nightcap. The hemispheres were, in fact, bathed in blood, which smeared the knife and fingers, but could not be traced to any local source, and the *tout ensemble* was such as neither I nor my colleagues had ever seen. The hæmorrhage would appear to be the result of exosmose or exhalation rather than of extravasation or rupture, for there was no accumulation anywhere, and it was pretty uniformly diffused throughout. The pia mater of the sulci clearly showed, through its deep red reticulated layers, the extent of this diffusion, and upwards of four ounces of fluid blood were found at the base. On depressing the skull, bloody serum escaped, in considerable quantity, from the spinal opening, thereby showing that the meninges of the cord were implicated; and the mass itself, divested of all surroundings, weighed 3 lbs. 1 oz. The corpus callosum of the left hemisphere was whiter and softer than its fellow of the opposite side, but the puncta vasculosa were not unduly conspicuous anywhere, and there was very little fluid in either ventricle.

Remarks.—This is a remarkable case, from whatever point we may view it, but space will only admit of my alluding to one or two of its more salient features, and even these must be disposed of very briefly. I alluded above to the resemblance it bore to a case of poisoning by morphia that came under my notice some years ago in the person of a woman aged 36, who was suffering at the time from ulceration of the os, and was, besides, or in consequence thereof, impressionable, capricious, and hysterical. In order to control or reduce one of those violent outbursts of erotic ardour or excitement under which she occasionally laboured, and enable her to get some sleep and regain composure, pills containing two grains of hydrochlorate of morphia were administered to her at some interval, on a certain evening towards the close of the hot season of 1861. She did not sleep well during the night, but there was no rambling or incoherency, and she was drowsy and sickish the following morning. About mid-day, and just as I was about to enter her room in company with her husband, she swooned away after uttering an unearthly cry—"An ominous, and wild, and desparate sound"[1]—and became at once speechless and insensible. Her face was covered with a deadly pallor, bubbles of perspiration started up on her forehead, there were twitchings of the mouth, inversion of the thumbs, and general convulsions, and there was also

"The all white eye
Turned up within its socket."

She looked, in fact, about to die on the spot, and her husband assured me that though she had fits frequently before she never suffered "aught like this." She recovered feebly under the usual stimulants, and was sufficiently well during the day to get out of bed and converse with her friends and family. Drowsiness, however, returned again, and in spite of all our efforts to the contrary, she lapsed into stupor as the night advanced, and died of exhaustion[1] late in the following afternoon, about thirty-six or forty hours after first exhibition of medicine. There was no examination of the remains. Now, taking into account the suddenness of the seizure in both cases, the ages and sex of the sufferers, the fact that though one was older and had borne more children, yet that the other had suckled longer and more recently, and resided besides in a more unhealthy climate; that the skin was cool, and the tongue moist, and the breathing quickened, and the sensibility suppressed, and the pupils contracted in both under somewhat similar circumstances, —I contend that I was justified in reasoning as I did, from one to the other, and in assuming that the same cause was at work in the two. The appearances described above show that I was wrong, and I never acknowledged an error or omission with greater pleasure in my life; for it is a disagreeable thing to be, under any circumstances, and, however unwittingly, the cause of depriving a fellow-mortal of life; and I shall never forget the painful impression this case produced on me at the time, or, I hope, prove insensible to the lesson it is capable of teaching even now. As to the cause of the hæmorrhage, it is not easy to say what that was, or whence this came, and all my efforts at discovering its source entirely failed. It could scarcely be due to the patient's anæmic condition, inasmuch as, "in true anæmia," according to Dr Day (Physiological Chemistry, page 246), "the blood exhibits no peculiarities of composition;" but it is not easy to ascertain whether the blood is within or without the vessels under the conditions here noted, and I believe the theory of transudation or escape of the intercellular fluid or plasma—fraught though it be with many difficulties—will better meet the requirements of the case than any other. With reference to this point, and after describing the circumstances under which hæmorrhage may occur within or upon the brain, Dr Watson says, "There is no reason, I think, for doubting that hæmorrhage, by exhalation, may take place, though rarely from the free surface of the brain, or rather of its investing membrane;" and again (vol. i., 3d ed., pp. 491–7) he says, "I stated before that the blood may sometimes be poured out by exhalation, in those less frequent forms of cerebral hæmorrhage, to which M. Serres has applied the term meningeal apoplexy, and in which the blood is found distending the ventricles, or spread like a cap over the surface of the hemispheres, without any laceration of the cerebral matter. This supposition rests, however, rather upon the analogy drawn from what is known to occur in other parts of the body, than upon any decisive or unequivocal evidence. Blood has not unfrequently been discovered in each of these situations, when the most careful scrutiny has failed to trace its source in any injured vessel. . . . In Dr Abercrombie's book there are two interesting examples of extravasation upon the surface of the brain, without any obvious source of the hæmorrhage." Copland, describing this condition says, in his Dictionary, vol. i. page 81, "It constitutes the coup-de-sang of the French, and is observed in those cases of coup-de-soleil, or sunstroke, which prove rapidly fatal. I have met with it in two cases of this description." I will only add, in reference to this latter point, that, though I cannot lay claim to a tenth of the experience of this laborious writer, yet that I have probably seen as many cases of sunstroke as he has, and in none of them have I ever met with anything like the condition described within.

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[1] A somewhat similar occurrence is described as follows by Moore:—

"And ere the scream
Had half way passed her pallid lips,
A death-like swoon, a chill eclipse
Of soul and sense, its darkness spread
Around her, and she sank as dead."

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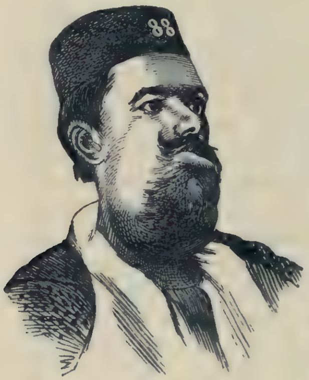
[1] Taylor gives particulars of four cases of death from one grain of hydrochlorate of morphia in adults, and I have lately heard of an instance in which an ordinary dose of James's powder proved fatal to a child; the specimen from which this was taken, and which, it may be added, came from a public store, was found on chemical examination, to contain 25 per cent. of morphia.

Case IV.—*Encephaloid Cancer.*—No. 198, Private John Sheehy, age 33, a large-sized muscular man of temperate habits, was admitted on the 11th December 1869, at Nowshera, with a tumour of the neck on the right side, which appears to be attached to the jaw, and which, he says, was first noticed as a "kernel" in the parotid space, towards the end of August last; it was then detached and separable, it is no longer so now; and its rapid increase, nodular outline, vascularity, and pultaceous boggy feel, would appear to point to, or imply the presence of, malignancy. On the 23d of the month, he complained of a pain in it which resembled the prodding of a needle, and the skin over the swelling became tense and brawny, and was in parts very sensitive to pressure; it subsequently assumed a dusky reddish hue, and looked here and there as if about to suppurate. Though I had no longer any doubt in my own mind as to its character, I yet thought it only due to him and to myself to give him the benefit of any aid or advice that might be offered by others, and with this view I asked for a consultation with my colleagues. This was held in the morning of the 28th, and it was settled between us, after a careful examination of the tumour and surroundings, that its rapid increase, the extent of surface involved, the vascularity and induration of neighbouring tissues, and, above all, the state of the local glandular and osseous structures, precluded all hope of a satisfactory issue from active interference. It was, indeed, our unanimous belief, that an operation necessitating, as it not improbably might, the deligation of the carotid, and the removal of a large portion of the lower jaw, would only aggravate the present suffering, without offering anything by way of relief in the shape of an equivalent in return, and precipitate a result which was in any case inevitable, and which no efforts of ours could obviate or even materially delay. He was, accordingly, allowed support in abundance; soothing remedies, including belladonna, were applied to the tumour; and a mixture containing arsenic, nitro-muriatic acid, and tincture of bark, was prescribed. Foulness of the mouth and gums was removed or reduced by the use of gargles of carbolic acid or Burnett's fluid, and an air-bed partially relieved the discomfort of his aching bones. He complained, on or about the 5th of January, of double vision, of what he called "glittering" before the eyes. The growth had meanwhile greatly increased, and the teeth on the affected side were loose and movable. The gums on same side were soft and spongy; there was considerable fœtor of the breath, and occasionally some sensorial disturbance on the approach of night, and the expression could no longer be mistaken or misunderstood. A photograph that was taken of him about this time, which I subjoin, in accordance with the suggestion of the Latin poet—

> "Segnius irritant animos demissa per aures,
> Quamquæ sunt oculis subjecta fidelibus"—

will pretty well show this, as well as give some idea of the size of the tumour, and, better still, save me the trouble of a more minute description thereof.



Without, therefore, unduly protracting the recital of details which admit of no great variety, or dwelling unnecessarily on incidents which must be familiar enough otherwise, I will here content myself with enumerating the more salient features of the case, and leave its minor points to inference and conjecture. Suffice it, then, to say, that the above symptoms increased apace, that the breath became more offensive, the teeth looser, the gums more boggy and œdematous, and that his temper, "never of the sweetest," became morose and irritable, and his disposition anxious and desponding. An attack of erysipelas, which supervened about the 20th January, had the effect of modifying these by diminishing size of tumour, and encouraging in his mind the delusive expectation of its early subsidence or dispersion. And, strange to say, the mass, which previously measured 10½ inches in length, and 6¼ in breadth from below upwards, was now only 6¾ in the former direction, and 4¼ in the latter, and it was, withal, soft, yielding, and spongy to the feel. This decrease, which was variously accounted for by my colleagues and myself as due to interstitial absorption, arterial obstruction, or metastasis, was, however, of short duration, and when the erysipelas disappeared, the growth of the tumour became, as was anticipated, more rapid than ever. His worst symptoms soon returned; he lost flesh daily from inability to masticate solid food or obtain sleep, and the fœtor of the breath was such that the other patients objected to sleep in the same tent with him. The tumour felt hard, brawny, and unyielding; it bled on the slightest provocation, and it was at all times the seat of a dull, heavy, continuous pain, which was, however, free from pulsation or throbbing. The teeth were all loose on right side as far as left bicuspid; the right cheek was so much swollen and infiltrated as to encroach upon and close up the right eye; and he suffered so much from the shaking of the dooley, on the march from Nowshera to Rawul Pindee, as to necessitate his being left behind at the last-named place. He was accordingly transferred to care of Surgeon of 1/6th Regiment, on the 6th February, and he died rather suddenly of exhaustion on the 25th of same month.

The following meagre summary of post-mortem appearances was furnished by the officer under whose care he died, and I am sorry I cannot commend it for the fulness of its information, or the accuracy of its details. It neither gratifies curiosity by minuteness, nor fulfils expectation by research, and it is, I think, much to be regretted that no notice was taken of the internal organs.

Post-mortem appearances five hours after death.—"The tumour was a soft cancer (encephaloid), apparently taking origin near the angle of the jaw, in the parotid glands of the right side; part of the bone of the lower jaw was bare near the angle, the periosteum being thickened and ossified near the part; body was not examined farther." The gentleman who made it had the kindness to inform me subsequently, that "the jaw was very little implicated, being merely stripped of its periosteum to the extent of a florin or so," and he thought "it"—the tumour—"may have sprung from the periosteum of the bone or the neighbouring glands."

Remarks.—Cancer is, comparatively speaking, so rare in the army, as almost to justify the publication of any cases that occur, irrespective of their own individual merits, and even though they present no more striking points of interest than those recorded above. I have myself seen only two cases in a service of more than fourteen years, and these occurred at very distant intervals of time and place, at Pembroke and Peshawur, and affected in one instance the lung, in the other the liver. I believe the experience of other officers is not much different from my own. With regard to the question of operative interference in this and similar cases, there can be no doubt that surgery is much less likely to prove of use in the removal of cancerous growths than in the treatment of almost any of the other diseases with which the military medical officer has to deal; and whatever may be the result at home, climate, and the contingencies of service, will always counsel abstinence in India. Had I seen this man at an earlier period of his illness, I might, perhaps, have been induced to interfere, and there might even have been some room for hope at a later period, had not I—and in this assumption I was confirmed by my colleagues—supposed that the osseous tissue was more seriously involved. It is, indeed, hard to reconcile the account given above with the appearances noticed during life; and the mobility of the teeth, the enlargement of the sublingual glands, the fœtor of the breath, and the sprouting spongy condition of the gums, seemed to point to a much greater implication of the bone than is there described. The result would, I suppose, be the same in either case; with this difference, however, that there would be an aggravation of suffering in the first place, and an exacerbation or increase of development in the second. It was obviously desirable to avoid these on the eve of a long march, and at a time when the disease was rapidly extending; and I have no sympathy with those who resort to the knife at all hazards, and under circumstances which clearly contraindicate its use. By way of illustration, and as an evidence in favour of the views here advocated, I will quote the following from the *Lancet* of January 1869, and with it bring this paper to a close:—"Professor Von Nussbaum, of Munich, has published a case of cancer of the rectum, in which he performed a bold operation. The neck of the bladder and the prostate gland had been invaded by the disease, and the enterprising professor, encouraged by four cases of a similar kind which he had treated, removed a portion of the rectum, the prostate, and the neck of the bladder. The details prove, the writer adds, that M. Nussbaum is ready for any emergency, but *relapses occurred in all the cases within a few months*, and it becomes a question whether surgeons are justified in undertakiug these operations." It does, indeed; and my own decided opinion is, that they are not. On reading such details, one feels half inclined to regret that this enterprising operator did not carry his enterprise a little farther, and cut short, at one bold stroke, the sufferings of his unfortunate patient; but Bavaria, doubtless, has a criminal code like other civilized countries, and it is to be hoped, in the cause of humanity, that all German experimentalists "in corpore vili" are not insensible to the calls of conscience.

Article VIII.—*Colonial Lunacy Boards; with special reference to New Zealand.* By W. Lauder Lindsay, M.D., F.R.S.E., Physician to the Murray Royal Institution (for the Insane), Perth.

(*Continued from page* 829.)

III. *Duties of a Colonial Lunacy Commissioner.*

In all probability the duties of an inspector of asylums in such a colony as New Zealand will be much more numerous, arduous, and varied than those of a British Lunacy Commissioner, and also somewhat different in kind. For instance, he is likely to be called upon to act as his own secretary and clerk; he will have no colleague, no proper office-provision. In other words, he will be expected *in himself to constitute a board of lunacy!* His duties of inspection will involve a large amount of travel,[1] mostly by sea—in stormy weather frequently, and on dangerous coasts. He will be called upon for numerous *reports*, which will be the subject of keen criticism by the abounding newspaper press of the country—a press which has "no respect of persons"—and by *parvenu* settlers, determined to get their money's worth out of a paid government official. If he is to discharge his duties properly, it will also fall to him to collect, tabulate, and generalize from the *statistics* of the different provincial asylums now existing, or that must shortly be erected. He will be appealed to by the authorities of these asylums for *advice* on all manner of details, involving him in a large *correspondence*. He will be summoned to all sorts of official *interviews*—with legislators on the one hand, and with the local asylum authorities on the other. In all cases of disputed insanity, especially in all cases of the plea of insanity in criminal or other legal procedure, he will probably be cited as an *expert*, and expected, as a salaried public officer, brought from home for the avowed object of making himself "generally useful" in all public or private difficulties relating to insanity, to give his evidence or certificate—*gratis*. He will, in fact, be a general *referee* in all matters connected with insanity—to whom every settler, as well as every public authority, will not hesitate to apply, expecting or exacting his immediate and full assistance, whether or not it be part of his stipulated duty. His work will thus so far be made for him, if he so permit. But, on the other hand, he may very much make his own work. The *letter* of his engagement may stipulate only for certain duties of *inspection and report:* and the simple discharge of these stipulated duties may be comparatively easy. In proportion, however, as they are easy, they are likely to be of little real service. The mere inspection of the provincial asylums is likely to occupy little time compared with the secretarial labours of a public servant, who desires to make his office of real use by the collection of material towards the elaboration of facts and statistics, available for the improvement of the lunacy laws, and of the whole lunacy system, of a young, rapidly rising colony in its plastic stage. It is quite impossible, however, that *a single inspector* of asylums can properly discharge the important and multiform duties of a lunacy board in such a colony as New Zealand.[1] Not only should he have clerical assistance, but a *central board* should be constituted, composed, it may be, as at home, partly of *unpaid* members,[2] including at least one barrister of eminence, with several members of the legislature or other public men, under the chairmanship of the governor of the colony, the superintendent of a province, or some other central authority.

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[1] The North Island is 500 miles long and 200 in greatest breadth; the South, 550 long and 210 in greatest breath. The group extends through thirteen degrees of latitude and longitude (34° 15′ to 47° 30′ S. lat. and 166° to 179° E. long.), with a coast-line of 4000 miles.

The tendency of colonial governments is to *overload* their officials with duty, and to *underpay* them in relation to the character and amount of the work exacted; in other words, while giving a public officer a very moderate salary for *one* man, they heap upon him the proper labour of *two* or *three.* The result is simply and surely this, that the work is not thoroughly done; that jacks-of-all-trades are substituted for masters of one, and that division of labour and increase of emolument become necessary, in order to the due execution of the work desired. Thus, in Otago, the secretary of the Education Board is also inspector of schools for the province. But the work either of inspection in country districts, or of managing in Dunedin the affairs of an important board, is sufficient to occupy the whole time and energies of any *one* man. Hence one department of the work has suffered, that of inspection, at the expense of the other. The officer in question, one of the hardest-working public men in the colony, and the very last man to shirk any duty that he could possibly accomplish, has repeatedly reported to the provincial government that the work of inspection was greatly in arrear, and that a subdivision of his official duties was requisite, in order to the due accomplishment of either department; in other words, that an inspector of schools was urgently required, distinct from, and in addition to, a secretary of the Education Board.[3] Again, the recently appointed Professor of Natural Science in the University of Otago—an institution which, notwithstanding its pretentious name, is simply on a par with the mechanics' institutes of Britain—is required to teach not only all the departments of natural history

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[1] Where, on the American continent, such officers have been tried, the good they have effected has been problematical—the evil apparent. Their office, in some cases, has been only nominally useful, in others obviously mischievous.

[2] Equally in Otago, Nelson, and Auckland, I met philanthropic or public-spirited men, who would be too glad, I am sure, to have such an opportunity of serving their fellow-colonists. I allude to such men as the Hon. Mr Ball, of Mongonui; the Hon. Mr Macfarlane, of Auckland; Judge Manning, of Hokianga; the Hon. John and Edward Cargill, both of Dunedin; Capt. Rough, of Nelson; and Mr Shaw, of Finegand, Otago.

[3] *Vide* "Departmental Reports" of the Provincial Government of Otago: Education, 1870, p. 2, and 1869, p. 3.

(that is, geology, mineralogy, zoology, botany, meteorology, and hydrology), but chemistry, mining, and agriculture; and he is, in addition, to be the curator of a provincial museum.[1] The consequence must be, either that he will teach one subject properly, and neglect all the rest, or teach all of them imperfectly (or improperly), and so defeat the object of his appointment; for the teaching of each one of the departments of science he is called upon to "profess" is work enough for any one man of average ability and attainment.

The duties of *British* Lunacy Commissioners are not models for those of Colonial Asylum Inspectors. For, in this country, their time is mainly, or at least too much, occupied with work that is in itself *unnecessary*—the supervision of existing asylums: while little or no attention is given to the much more important supervision of the insane who are *not in asylums*, and to the determination of those who are suitable, on the one hand, for residence in private dwellings, and of those who, on the other, require hospital treatment. Nor is anything done officially towards the *prevention of insanity* in future generations,—a subject which is of infinitely greater consequence than the custody or cure of those who are already insane. When a public asylum has been, in this country, constructed under the auspices of a board of lunacy, a competent superintendent and staff appointed, and a local board of directors constituted, it may be not only safely, but best, left to manage its own affairs; and the time occupied by the visitation of, and reporting upon, such local establishments—which in England amount to 71 public and 106 private asylums[2]—might be much more advantageously, for the public benefit, directed to the condition of those insane persons who are scattered throughout the country in the houses of their relatives or friends, in other private dwellings, in poorhouses and jails, or in other receptacles of the dependent or criminal classes.[3] The result of the imperfect supervision of the insane not in hospitals in Britain is this, that every now and then cases of gross neglect of, or of cruelty to, lunatics are detected in private dwellings, and become the subject of sensational and damaging articles in the newspapers

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[1] *Vide* what I have said on this subject in the "Scottish Naturalist" for July 1871, p. 66.

[2] According to the last (25th) Report of the English Commissioners in Lunacy (1871):—

I. Public—(*a*) County and Borough Asylums		51
(*b*) Hospitals		20
		71
II. Private—(*a*) Metropolitan	41	
(*b*) Provincial	65	106
		177

[3] In 1870, in England, according to the 24th Report of the English Lunacy Commissioners (p. 263), no less than 11,358 insane paupers were in workhouses, and 7086 "residing with relatives or others."

throughout a country which boasts, vain-gloriously, of taking the lead in the humane treatment of its insane,[1] and therein or thereby of showing an example for the rest of the civilized world to imitate! Such incidents occur in England, which has certainly the most fully-equipped Lunacy Board of any country in the world. It is not, however, by Lunacy Commissioners that such instances of ill-usage are generally detected, though they never fail to be "in at the death," and contrive to get as many fingers into the pie as is possible under the circumstances. Similar occurrences take place in other countries whose lunacy system is usually regarded as perfect, and probably for similar reasons, that the time of Lunacy Commissioners is occupied by different and less necessary duties. Thus, it would appear that the inspectors of asylums of Belgium must perform their duties in a very perfunctory way to omit detection of such cases as that described under the heading "Cruel Treatment of Belgian Lunatics," in the British newspapers of January 1872, commenting on recent disclosures concerning the state of the asylum of Evere, near Brussels. "The press," we are told, "of Belgium directs attention to the conduct of the inspectors of asylums, and public opinion generally calls for a revision of the law which regulates lunatic asylums" in that country. It is a curious but instructive illustration of our national complacency or egotism, that our public press directs attention to a state of affairs in Belgium which exists among ourselves;[2] and for which our Belgian confrères are not more blameworthy than we are!

Not only, however, does the present kind or degree of supervision of the public asylums of Britain by its Lunacy Commissioners appear *un*necessary, it is in certain respects also mischievous. It tends, for instance, to the destruction of all independence and originality of effort on the part of asylum physicians, to the reduction of all local asylums and their affairs to a uniform official level of docile and respectable mediocrity. By the imposition of multitudinous regulations,[3] forms, and books; by incessant and vexatious interference[4] of various kinds, it distracts the attention of the medical heads of provincial asylums from their proper duties, occupying them with correspondence, book-keeping, and statistic-compilation.[1] In short, whatever may be the amount of *good* effected by our Lunacy Boards—and there can be no doubt it ought to be much greater than it is—the *mischief* they do, so far as concerns our public asylums, is much more obvious, and perhaps counterbalances the good resulting from their supervision.[2] This should not be the case in *any* country, and, above all, such a state of matters ought to be avoided in a *new* country. So far from *dis*couraging, Lunacy Commissioners in all countries should *en*courage, or at least leave alone, independence and originality of opinion and practice, so long as they do not lead to manifest absurdity or abuse. All progress in the treatment of the insane has arisen in this way, by the unrestricted development of personal originality and personal enterprise, and only in this way can further progress be expected.

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[1] How ill-grounded are *England's* claims to pre-eminence may be gathered from the last Report of the Massachusetts State Lunatic Hospital at Northampton (16th, 1872, pp. 29 and 31), written by Dr Pliny Earle, one of the best-known alienists of the United States, who only last summer (1871) made a third visit to the chief lunatic asylums of Europe, of which he has inspected, during the last thirty years, no less than 83.

[2] Cases of ill-treatment or neglect are given in some of the Reports of the English Lunacy Commissioners themselves; *e.g.*, in the 23d, for 1869, pp. 98 and 102.

[3] Arthur Helps, in his "Hints for Essays" (in "Good Words" for February 1872, p. 143), says:—"*Rules* are the inventions and the safeguards of *mediocrity*."

[4] I might cite at least one case in which persistent long-continued annoyance from a Lunacy Board led to the shattering of the health of an asylum physician, and finally to his resignation.

There could not, then, be a greater mistake than to *overgovern* the local asylums of a young country. I could name some of the largest and best-known British asylums, the curse of which is or has been overgovernment by their boards of managers; the existence of which boards and managers proving a upas-tree, under whose withering shade prosperity or efficiency, *quoad* the welfare of the patients, is simply impossible. Unfortunately, these asylums are usually in or near our chief cities, and, on account of their greater accessibility, are those generally visited by foreigners desirous of judging of our system of dealing with the insane, or of constructing hospitals for their treatment. I know of no exception to the rule that, in proportion as the affairs of a public or private lunatic asylum are confided to *one supreme authority*, they are efficiently managed, harmony prevails among its officers, and reputation is attained. On the other hand, just in proportion as there are "many masters," a number of directors intermeddling with matters which it is impossible they can understand, or a number of officers having independent position and conflicting authority, encouraged to check or spy upon each other, the opposite unfortunate conditions do not fail to result. I can recall no instance in which a board of directors has given celebrity to an asylum—save by their fortunate selection of a medical head to whom they have confided the management of its affairs. Nor do I know of any case in which any other reputation than an evil one has resulted from the futile attempts at harmonious management by a multitudinous staff of officers of equal, or nearly equal, position and authority. On the other hand, it is easy and satisfactory to point to several asylums, private and public, the well-deserved reputation of which is due entirely to the efforts of the medical head,[1] and to the good sense of his board of directors, where such a board has existed, in leaving the management virtually in his hands.

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[1] This is most obvious where the asylum physician has no medical assistant or clerk on whom to devolve duties that ought to occupy the attention of a special officer at a special salary.

[2] On the subject of independence of action without boards as in America, contrasted with the tyranny by boards as in England, the reader may compare an English criticism in the "Journal of Mental Science" (vol. xii., for 1866, p. 211) with an American one in the same Journal (vol. x., for 1864, p. 585).

The supervision of the patients in private dwellings ought to be made a matter of primary importance in the public provision for the insane of a young colony. For, the extent to which the family system is practicable must determine the number and character of the central hospitals required for those who are unsuitable for private custody or treatment; and it is these public asylums that are the chief cause of expense to the public exchequer. It should be laid down as a fundamental series of propositions, in making public or state provision for the insane in a new country, that—

(1.) No more central hospitals (so-called lunatic asylums) should be constructed than are absolutely necessary.

(2.) Such hospitals should, from the first, so far as possible, be restricted to their legitimate functions, the treatment and custody of those insane who are unsuitable for extra-mural management.

(3.) Only a proportion of the insane of any country require hospital treatment: the remainder being capable of much more economical and equally efficient management in private dwellings, on the basis of ordinary domestic life.[2]

It is generally supposed, or assumed, even by those who are favourable to the home-treatment of the insane, that what is now widely known as the *boarding-out system* is possible only in *old* countries, such as Belgium[3] or Scotland, in either of which it may be seen at the present day in successful operation. I believe such an opinion to be a mistake. After studying the system both in Belgium and Scotland; and after visiting New Zealand, Australia, the United States and Canada, I am convinced that there is less real difficulty in inaugurating and successfully carrying out such a system in young or *new* countries (whose settlers are keenly alive to their own interests, and who are liberal and tolerant in their views, eminently adaptive and progressive in their social economy or polity) than in *old* countries such as England (whose inhabitants are saturated with prejudice, and environed with absurd customs frequently springing originally out of very different conditions of society, sometimes dating from the remote ages of superstition).

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[1] For instance, the Crichton Royal Institution, Dumfries, whose reputation was created for it by Dr Browne, afterwards one of H.M. Commissioners in Lunacy for Scotland.

[2] The distinguishing features of the boarding-out or family system of treatment are discussed in the following papers:—

(1.) "The Family System as applied to the Treatment of the Chronic Insane."—Journal of Mental Science, vol. xvi., 1871, p. 497.

(2.) "Gheel in the North."—Brit. and Foreign Medico-Chirurg. Review, January 1871, p. 33; and "Northern Ensign" (newspaper), 29th September and 17th November 1870.

[3] I visited Gheel in August 1871; inspected the Central Asylum, under the auspices of Dr Bulckens himself; and was accompanied to specimens of all classes of the houses, cottages, or huts containing insane boarders, by one of the most intelligent of the inspectors of the out-boarders.

What is really mainly required for the development of the economical system of the family treatment of the insane in all countries is, enlightened public opinion on the one hand, and a suitable class of custodiers on the other. That such *custodiers* are to be found in all the countries or colonies I have mentioned, I have myself no doubt. In New Zealand they are to be looked for preferentially in the peasant-proprietor class, among married couples, who at home belonged to the rank of ploughmen or artisans—who have spent a few years in the colony in service, saving in that time a sufficiency from their high wages to enable them to purchase little slices of 50 or 100 acres of freehold land on which they have erected modest homesteads.[1] They have emigrated with a laudable desire to better their worldly position; and by industry and good behaviour they have succeeded in doing so. But they are not well enough off to render them independent of any means by which they can legitimately eke out the income arising from their invested £50 or £100. Such persons are usually frugal, prudent, sometimes wonderfully well educated, intelligent, shrewd, kindly, charitable, and hospitable. Struggling to establish their position as landed proprietors on the small scale, many of them would, I feel assured, be glad to assist themselves by taking insane boarders[2] of the same class as those to be found at Gheel in Belgium, or at Kennoway and other villages in Scotland. Nor could a more desirable position be obtained for the patients. Free life in a very literal sense—all the joys of domesticity in a family circle, which usually includes a number of children—the advantages of healthy and frequently beautiful position—all the creature comforts and all the stirring interests of farm-life—healthy, homely, abundant fare—a motive to work and a sphere for work in the cultivation of the virgin land, or about hearth and home, according to sex,—the homestead of a New Zealand peasant-farmer, such as I have myself met with and lived upon in Otago, with the life to be found in and around it, appears to me to offer the very *beau idéal* of the family system of disposing of the harmless and industrious insane.

The definition of the duties of a Commissioner in Lunacy requires some definition of those of the local asylum physicians. There must be many duties that a single inspector of asylums cannot perform, which may be fitly discharged by the provincial asylum physician. Thus, he may, and ought to, superintend the colonization of out-patients in his own district; because frequent interchange must occur between out and in patients; and the two modes of treatment—boarding-out and hospital life—are but departments of one judicious system of management, which ought to be worked by the same authorities. If there is only one general inspector of asylums, the provincial asylum physicians should also be local or district inspectors of lunacy; though, in order to the discharge of such extramural duties, they would require to have either assistants or deputies. It is impossible, however, that they could, with due justice to their primary functions, inspect *all* cases of insanity occurring in a large, or even in a small, province. They would require the assistance of the police, and of the legal or medical authorities, scattered throughout the country. Nor is there any good reason why the provincial asylum physician should not be allowed—as is so frequently the case in Britain—to act as a *consultant* in insanity cases, and in this or other ways to eke out a salary which is not likely to be independently large or adequate.

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[1] Thus, I met in Otago with married couples of the ploughman class getting £100 a year of wages, with everything found, on an up-country station—the man acting as farm-overseer, the woman as housekeeper. They were enabled to save almost the whole of their earnings, and in a couple of years were bidding for 100-acre lots on which to set up for themselves, with a certainty of making an independence in the event of life and health. There were also many cases of single men—young clerks, artisans, or ploughmen—possessing their fifty acres of bush, hill, or flax land, which they had bought at £1 per acre.

[2] I found many of them thankful to get sane boarders, whom they made most comfortable.

IV. *Status and Powers of a Colonial Lunacy Commissioner.*

In order to the highest measure of usefulness of a colonial inspector of asylums, he ought to stand in proper relation to the Government, the public, and the authorities of the provincial asylums respectively. Their interest and his ought to be the same—the welfare of the insane of the colony, and the devising and carrying out the best means for securing their recovery or custody. There ought to be a harmonious co-operation between all classes of authorities concerned in the supervision of the colonial insane, and of hospitals for their treatment. In proportion as such harmony exists, there will be efficient and economical action. If, instead of pulling together in the same direction, the different authorities act upon their respective rights or powers by opposing each other, or neutralizing each other's efforts, nothing but confusion can result, and the position of the inspector will become a false one, both as respects himself and others. In order to harmonious co-operation with an inspector, it is necessary he should command the confidence and respect of all classes of the other authorities, who are concerned with him in making proper provision for the management of the colonial insane. He must, therefore, possess the qualities that in such a public officer are calculated to inspire confidence and esteem, which I have already specified under the head of his qualifications for office. Inasmuch as the best judges in a colony of the qualifications of such an official are the physicians of the various provincial asylums,—men of experience in the specialty of insanity,—it is more especially important that his experience and ability should be such as to command their respect.

Unfortunately, *in Britain* there is a natural antagonism between lunacy commissioners and asylum physicians, arising from the very different point of view from which they respectively regard the same things.[1] This, again, is due to the circumstance, that very rarely indeed, in this country, is a lunacy commissioner appointed on the sole ground on which he ought to be appointed—that of merit—of *conspicuous ability and experience:* very rarely is he selected from among the most eminent practitioners in lunacy, or asylum physicians, in whose ranks alone are to be found the most able experts in lunacy matters. Too frequently the gentlemen appointed by Government have had no experience in the treatment of insanity, or in the management of asylums; and, indeed, it would appear as if ignorance of their special duties were considered a qualification. This practice of our Government, which is not confined to lunacy boards, but extends into every department of the public service,—the appointment of the *influential incompetent*,—has tended more than anything else to place Britain at a sorry disadvantage with, or in most unfavourable contrast to, other nations—for instance, Germany—in respect of, *e.g.*, her army[2] and navy, universities, schools, and education, technical and general. As regards lunacy commissioners, it is impossible that asylum physicians, many of whom are men of far higher ability, and of infinitely greater experience, than the majority of the Lunacy Board officials placed over them by a paternal Government, can regard with any respect, other than that which the laws of the country and the precepts of Christianity exact from inferiors to superiors *in office*, men who possess none of the inherent qualities or qualifications that deserve respect—can esteem gentlemen who owe their good-fortune to their relationship to, or acquaintance with, this or that Lord Chancellor or Lord Advocate, member of Parliament, or member of H. M. cabinet who may be at the moment in office, and not to any inherent merit of their own. It is not surprising that the general feeling of asylum authorities in this country, including the directors—who represent the best classes of the public—as well as their physicians, should be this—that Lunacy Commissioners are paid for fault-finding, and that they succeed in discharging this very easy though invidious duty. Nor is it wonderful that inexperienced men should be doctrinaires, and should believe in and be actuated by *criteria of excellence*[3] of the institutions they are called upon to inspect, that are generally fallacious and frequently ridiculous; that they should every now and then contradict themselves, approving at one time what they censure at another; that the boards of directors of asylums should prefer their own ample experience of establishments, with all of whose details they are minutely acquainted, to the suggestions of hypercritical commissioners who visit once or twice a year for a few hours; that local boards and their officers should avoid, so far as they can, the dictation and interference of the central Board of Lunacy, while the latter stretches its power to the utmost limit, so as to bring all local boards and institutions—and especially those which are independent or recalcitrant—under their official sway. In short, our colonies could not have *worse* models—in certain respects—in the construction of their lunacy boards than those of the home country!

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[1] I have, for instance, given myself the trouble of visiting asylums recommended by the lunacy boards of each of the three kingdoms as possessing features worthy of imitation, with this result: that in *all* cases I have been grievously disappointed. Their *criteria of excellence* were obviously most fallacious!

[2] It is perhaps in war, where decisive action is pre-eminently called for, that the effects of this incompetence of leaders becomes most apparent. The Indian mutiny and the Crimean campaign furnish a sufficiency of disgraceful but instructive illustrations.

[3] These *criteria* include, for instance, the absence of mechanical restraint and of seclusion; the number in bed or engaged in occupation or out-door exercise;

The want of adequate *power* to compel this or that reform is a common complaint among the lunacy boards of Britain or other countries.[1] In our own country, the public is chary of confiding too much power to central boards, that have over and over again shown their disposition to abuse the powers they already possess, and to possess themselves of others to which they have no statutory claim. If a defect is pointed out by the public press in our lunacy system, and the inference is drawn that surely this is a matter which would never have happened had the well-paid lunacy boards of the country been properly vigilant, the said boards are sure to be ready to explain, with many regrets, that that particular defect is just one which their *limited powers* are inadequate to rectify. The truth is, that our Lunacy Commissioners possess many unnecessary powers, and discharge certain unnecessary duties, while they do not possess powers, and do not perform functions, which are both more desirable and more necessary. The power of a Colonial Lunacy Commissioner is likely to be confined to the inspection of asylums, and reports thereupon to Government. The latter will probably reserve to itself the power to carry out or not the suggestions made by their inspector, or to remedy or not the evils which he may point out. But, if the present Government of New Zealand is not much more zealous and active in lunacy reform than its predecessors, or than the sister Government of New South Wales, the recommendations of an inspector of asylums may come to nought, at least in his day and generation; and his services may prove, in this way, infertile. If it is inexpedient to confide certain powers to an individual, they should at least be safely confided to a board constructed of the elements already suggested; and this is just one of the many arguments that can be adduced in support of the recommendation

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the mortality and recovery rates; quietude; cleanliness of galleries; use of *parole* or of drugs, alcoholic stimulants, and malt liquors; farm or garden returns, and so forth.

[1] *E.g.*, The Board of State Charities of Massachusetts, in reference to the insane of that state.

that *every British colony should possess a central Board of Lunacy*, which need not be by any mean an expensive one, if there are men in the colonies, as at home, able and willing to give their time and attention gratuitously to the public good in the public service. The power of a Colonial Commissioner of Lunacy should, however, be sufficiently ample at least to secure for him the respect of the local asylum authorities; though, at the same time, he should be careful in the exercise of his powers. Local asylum physicians should have—and must have, for the due performance of their important functions—a large measure of *discretionary power*, and should not be unnecessarily interfered with by the central authority. Non-interference with the superintendents of provincial asylums—unless in cases of obvious necessity—should be a part of the official policy of the commissioner. *Over-government* should be sedulously avoided. Instead of acting the part of a captious critic, ready to find fault with, and to expose to the public, all the errors of omission or commission—all the petty accidents, misunderstandings, and *contretemps*, that must occur in the management of every community of the insane—it should be the policy and privilege of the inspector, by all his personal or official influence, to support the medical directors of the various provincial asylums against the effects of the ignorance and prejudice of the public on the one hand, and the Legislature on the other. If the Government inspector is—as he should be—a gentleman who has himself occupied for a series of years a position of the highest responsibility in the management of a lunatic asylum, he will be—or ought to be—ready thoroughly to sympathize with all the difficulties of his colonial colleagues; and it should be his duty and delight to endeavour to lighten their sorrows and labours, and to encourage them in the independent and self-reliant discharge of their most delicate duties. On the other hand, the provincial asylum superintendents should be able to look up to the Government inspector both as a friend and as an authority; they should not fear to consult him in all their difficulties; nor should they hesitate to appeal to him against the public or official misunderstandings or injustice that are sure to occur now and then to each of them. It is obviously highly desirable that this sort of paternal relationship should subsist between the central Government authority and the supervisors of local hospitals for the insane, over whom and which he is called upon in a sense to preside. *Harmonious co-operation* is as important to the welfare of the local institutions as to the usefulness of the general Government Lunacy Department. But, as before explained, such a relationship can subsist only if the inspector placed over them by Government is a man whose status, ability, and experience are calculated to command the esteem of the local physicians. Such a man is not—or at least at the period of my visit was not—to be found in the colony itself, and is scarcely to be found in Britain. If he is to be met with in the ranks of our asylum physicians, he is not likely to sacrifice his comforts and prospects at home unless for liberal emoluments, proper superannuation provision, and a clear definition of practicable duties and status, on the part of the New Zealand Government.

V. *Mode of selection and appointment of a Colonial Lunacy Commissioner.*

The existing mode of filling up certain classes of lunacy appointments at home and abroad, is by—

(1.) Public *advertisement* in the general newspapers, as well as in the medical journals.

(2.) Public *competition;* and—

(3.) The application of the *testimonial* system.

No doubt, public advertisement is the best means of drawing forth candidates, but not *the best* candidates. I have known this system fail over and over again, as regards the appointment of all classes of asylum officers. Repeatedly—in the institution over which I have myself presided for nearly eighteen years—I have had occasion to set aside all the numerous candidates who have applied in answer to public advertisement for subordinate offices, notwithstanding the said applicants included many persons of experience in other asylums. The same has happened in other institutions of a similar kind; the authorities of which have been glad to *offer* their appointments to suitable non-competing persons, and have had reason to congratulate themselves if, by more liberal salaries, or by other inducements, they were successful in securing their acceptance. In truth, if the *best qualified* persons are desired, they must be sought for, and the appointments *offered.* Men of reputation will not submit to the indignity of comparing themselves, or of having themselves compared, with hosts of incompetent men, their inferiors, not only in age, but in every respect, who come forward in reply to the invitation of a public advertisement, and who can lose neither prestige, nor anything save the cost of their "testimonials," in the event of non-success. In exercising my own patronage, I have repeatedly had occasion to set aside the influentially-urged claims of candidates, and to *offer* vacant appointments to competent but non-competing persons. And the only two asylum appointments I have myself ever held were *offered* to me. Under other circumstances, I certainly would not have been appointed, for the simple reason, that I would not have competed nor become a candidate, and this because, at the time the said offers were made, I had no desire for appointments of such a kind. The *principle* of selection and appointment in the case of a colonial lunacy commissioner ought to be that which actuates the German Government in making appointments to its universities;[1] the result thereof is the obtaining of a class of men far superior, as a rule, and as a whole, to the occupants of British, and especially of Scotch, university chairs.[1] That principle is the *search for the fittest* man to occupy, with dignity and advantage, a given post; and the *offer* of the said post as a compliment to his recognised reputation or ability. The *testimonial* system has become an utter nuisance in this country. As a means of bringing forward the best men for a given post, it is utterly fallacious and non-reliable. Testimonials are granted from most opposite motives—frequently from motives of an indefensible or even disgraceful kind. Sometimes they proceed from good-natured persons, ignorant personally of the candidate on the one hand, and of the nature of the office for which he applies, on the other; or they are given by personal friends, who naturally take one-sided biassed views of a candidate's abilities. In the exercise of my own patronage, I have been led to suspect the character of the candidates who produce flaming testimonials, which are undoubtedly often "too good to be true," or the character of the granters of such so-called "certificates," and I never rely on *them* when I can possibly help it. I have been in the habit of appealing confidentially to some one of the certificate-givers, in whose honesty and opinion I believed I could place reliance, and I have sometimes found that the same person who grants a most favourable or flattering public (or printed) testimonial, actuated by the kindly though not altogether commendable desire, "not to stand in the way of a young man's advancement," has privately expressed his conviction that a given candidate was quite *un*suitable for my purposes, or for a given office. Such is the belief of many of the best men of the day, in this country, in the absurdity of testimonials of the orthodox kind, that they rather abstain from application for offices for which they are eminently fitted than condescend to give the approval of their personal example to so vicious and absurd a custom. Men of recognised reputation do not require, or should not require, any such questionable assistance. Their publications, or their work, on or by which their reputation has been gradually built up, have long been before the world; and if they are worth anything at all, the press, and, through it, competent *public opinion*, has pronounced an unbiassed judgment.

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[1] In Germany, says *Nature,* of April 13, 1871 (discoursing on "Natural History Museums"), "Appointments to the professorial chairs are *not* thrown open to *competition,* and the system of *testimonials*—humiliating alike to the candidate and his supporters—is *unknown* in German universities. Men of

Having now stated what *ought to be* the emoluments, duties, status, and mode of appointment of colonial lunacy officials, let me introduce, by way of contrast, a single illustration of what the conditions of their appointment too frequently actually are. In 1865, invitation was issued, on behalf of the Government of South Australia, to candidates in this country for the office of Physician-superintendent of the Government Asylum at Adelaide. The printed circular issued by the Government agent in this country, containing

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reputation for their knowledge and capability of teaching are chosen by the senate, proposed to and appointed by Government, ... guided by the advice of men able to judge of the merits of the candidates proposed."

[1] So far as concerns, at least, Natural Science Chairs, I have offered certain detailed observations on this subject in the 'Scottish Naturalist,' v. i. (1871), pp. 62, 72.

details for the information of intending or possible candidates, contained the following unsatisfactory and discouraging intelligence. The amount of salary was not specified. Probably it was the purpose of the Government to make the best *bargain* it could with any man willing to accept office? The salary—probably some bagatelle under £500 a year—was not to begin until the arrival of the superintendent-elect at Adelaide was officially reported to the authorities there. £100 was the allowance for outfit and passage. There was no pension, but "a fixed gratuity of one month's pay for each year of service on retirement;" that is to say, that, assuming a salary of £600 at the time of retiral, he would receive the munificent sum of £500 for ten years' service, or £1000 for twenty years—in other words, not one year's proper emolument! No separate house was to be provided, and the colonial surgeon was *ex officio* to be his superior or inspector—an officer probably without any special experience of the insane, or of hospitals for their treatment.[1] A gratifying series of inducements to offer to any young man, with even the most ordinary prospects of an *assistantship* in Old England! Had the South Australian Government aimed at securing the services of a man of the most ordinary or commonplace qualifications, it should have offered a salary of £1000, to begin from the date of appointment in this country, with superannuation at the rate of at least two-thirds of the total value of office at the time of retirement; £200 for outfit and passage, separate residence, and a proper status in regard to all the colonial authorities, including the colonial surgeon. In short, the circular of the South Australian Government was an instructive illustration of the absurdity of colonial authorities, in expecting even moderately good men for their appointments, in the absence of all proper inducements.[2] The result of such circulars and of such conditions of appointment is, that—with the single exception of Dr Manning, in New South Wales (who qualified himself for his office by an inspection of the most recently constructed lunatic asylums of Britain, the United States, France, Belgium, and Germany, and by the publication of an exhaustive report, showing how thoroughly he had availed himself of his singular opportunities for observation)—I know of no colonial lunacy appointment that has been in all respects either what was desirable for the colony, or what was expected by its local authorities.

He, then, will be most foolish who accepts such an office as that contemplated by the present Government of New Zealand, without a clear and satisfactory understanding beforehand of all the future, as well as present, details of his appointment; including a proper *definition* of all his duties, and of his relations to the General Government on the one hand, and to the authorities of the Provincial Asylums on the other; the amount of his salary, with its periodical or other increment, and the date of its commencement; the amount and conditions of his superannuation allowance; the amount and regulation of his travelling expenses; the allowance for outfit and passage; the provision for annual or other holidays, or for illness or other unavoidable absence from duty; for library and museum furnishings, or for the books, plans, and other documents necessary for consultation or reference.

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[1] The awkwardness and injustice of such an arrangement was pointed out by the "Commissioners of Inquiry on the Lunatic Asylums of New South Wales," in their report of 1855, p. 9; and in the evidence of Dr Campbell, of the Tarban Creek Asylum, contained in the appended "Minutes of Evidence," p. 66.

[2] In this Adelaide case, the result was, that the gentleman appointed did not remain long in office; he very soon returned to this country; and is now superintendent of one of the numerous county asylums of England.

VI. *Constitution of Lunacy Boards in Europe and America.*

My previous remarks have had reference exclusively or mainly to the individual commissioner or commissioners in lunacy, to be appointed in each of our colonies. But it is desirable to add a few notes on the varying constitution of *Boards of Lunacy* in Britain, the continent of Europe, the United States, and in those British colonies which, in any form, already possess such boards or their supposed equivalents.

The most *fully equipped* Board of Lunacy, and in this respect a model for other countries, is that of *England*, which consists of a chairman, ten commissioners, six of them paid, three of whom are medical and three legal;[1] a secretary, and a staff of clerks.

In *Scotland*, the Lunacy Board consists of a chairman, four commissioners, two of them paid and medical, the other two (unpaid) legal, two deputy-commissioners, both medical, a secretary, and three clerks, besides a messenger or porter. The Scotch law also makes provision for *district inspectors*, but only one appointment has yet been made, so far as I am aware, under the statute, viz., in Forfarshire, a county that possesses two excellently-managed public asylums. Hence it would appear, that such local appointments are not considered desirable or necessary by the county authorities or the general public of Scotland.[2]

In *Ireland*, two medical inspectors constitute, with three clerks, a "Board of commissioners for the erection and control of lunatic asylums."

In *France*, there is or was an "Inspecteur-général du service des aliénés" (Dr Rousselin in 1867), for the whole of France, as well (apparently) as local (district) inspectors. Thus, there is an inspector-general of asylums in the prefecture of the Seine (Dr Girard de Cailleux), who has his headquarters in Paris.

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[1] I can understand the advantage of having barristers, or lawyers of any class, on a lunacy board; but I cannot see nor admit that they are such suitable inspectors of asylums as medical men specially trained by their previous experience for such duties. In England, the medical and legal commissioners visit in couples, one representative of each profession; the best possible arrangement, undoubtedly, if a board contains *paid legal* inspecting commissioners.

[2] It is an anomaly in the case of Forfarshire, that a gentleman, probably without special knowledge of lunatic asylums or their inmates, is called upon to supervise establishments conducted by men of such experience and repute as Drs Howden and Rorie,—establishments, moreover, that are twice a year visited by the central or general lunacy commissioner.

In *Belgium*, there are "inspectors of asylums," resembling apparently, in their status and duties, those of France; while the far-famed *Gheel* has its own *different grades of inspectors*, non-medical as well as medical.

In *Norway*, the "Board of Control" of the State Asylum is more like our local boards of asylum directors than our boards of lunacy. Its members visit the said asylum twice a month, and have duties of a much more minute kind in regard to inspection than the committees of management of most public asylums in either of the three kingdoms. I have elsewhere described its constitution and functions.[1]

In the *United States* of America, a central or general government board of lunacy is greatly wanted, were it only to collect into one annual report the statistics of insanity and of lunatic asylums in states so numerous and so differing in climate and other characters as those which compose the great American republic. That such a board does not yet exist is probably due to the opposition of the physicians of the various state or other public asylums throughout the Union, who point to the faulty working of the English and Canadian boards as a ground for their non-approval. To these local authorities, who exercise much greater public influence in America than do their brethren in this country, the idea of a supervising board of *any* kind is obviously most unpalatable. In 1864, the veteran Dr Ray, the well-known author on the "Medical Jurisprudence of Insanity," published an essay on "American Legislation on Insanity," which was "virtually a report drawn up by him as chairman of a committee appointed by the Association of American Asylum Superintendents."[2] He indicates the evils arising from the tyranny or improper interference of central boards (p. 577), and shows how much mischief has been done in England by over-legislation (p. 578). Dr Gray, the well-known editor of the "American Journal of Insanity," and head of the New York State Asylum at Utica, in the same journal tells us why any form of board of control over the state asylums is unpalatable in all the states (p. 583); and criticises severely the operations of the English and Canadian Lunacy Boards (p. 585). But the objection of American asylum superintendents to the establishment of a board or boards of lunacy in the United States, seems to attach simply to the supervision of the public asylums, which as a whole are well managed, and require no inspection of such a kind.[3] They offer no objection apparently to the supervision of the insane *not in asylums*, whose condition is as bad perhaps as that of similar classes of the insane in any other part of the world.[1] In truth, there is, I believe, no country in the world which so much requires a central board, as well as local boards, of lunacy, as the United States of America, in order to the proper supervision of the insane *not in asylums*;[2] and it is one of the most prominent and serious defects of the lunacy system, in many respects so admirable, of that republic, that no such public bodies as yet exist.

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[1] "Insanity and Lunatic Asylums in Norway." Reprint from the Quarterly Journal of Psychological Medicine, April 1858, pp. 42, 44, and 45.

[2] It is quoted in the Journal of Mental Science, vol. x. (1865), p. 576.

[3] *Vide* paper on "American Hospitals for the Insane compared with those of Britain." Edin. Med. Journal, Dec. 1870, p. 517.

In 1863, a Commission on Insanity was appointed by the legislature of the *State of Massachusetts*, and its report was published in 1864. "The Commissioners conclude their report by advising the appointment of a *permanent Commission in Lunacy*, wielding powers similar to those of its English prototype."[3] There can be no doubt that such a board *ought to be* forthwith appointed in such a state; but, up to the present date, no such board has been established, and there seems small likelihood of its speedy establishment. The work of supervision of the insane in asylums is, however, now undertaken in Massachusetts by the Board of State Charities,[4] which is composed of seven unpaid members—the chairman being Dr S. G. Howe, of Boston, the well-known writer on idiocy; a visiting agent, general agent, and secretary,[5]—all salaried, but with most inadequate salaries, considering the amount and nature of the work which devolves upon them; and a staff of deputy agents and clerks. The work of inspection, which in England devolves on the Lunacy Commissioners, falls here apparently upon the general agent and secretary. The powers of the Board are "to investigate and supervise" the state asylums or other public receptacles for the insane, "and to recommend such changes and additional provisions as they may deem necessary for their economical and efficient administration."[6] It can transfer confirmed and incurable cases from the state hospitals to asylums for the chronic insane, *e.g.*, that at Tewksbury. But the Board of State Charities has too much *other* work to do to have time for the supervision of the insane *not in asylums;* its powers *quoad* the insane are absurdly restricted, and its whole operations as a board of lunacy are open to adverse criticism.[1] Moreover, the provision made for the supervision of the insane in Massachusetts is so cumbrous and defective that we are told that, by a law of 1864, no less than four commissions were organized, most unnecessarily, to do only part of the duties that are discharged in Britain by a single board of lunacy.[2]

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[1] See what Dr Alexander Robertson, of Glasgow, has said on this subject in his "Notes of a Visit to American Asylums." Journal of Mental Science, vol. xv. (1870), p. 85. His observations and reflections led him also to advocate the establishment of a Central (or General Government) Board of Lunacy (p. 89). His suggestion, however, was that it should be temporary, and composed of the leading asylum superintendents of the various states.

[2] If we may believe the revelations of the inner life of certain American asylums, as given by the authoress of "Behind the Bars," published in Boston in 1871, and reviewed in the Journal of Mental Science, vol. xvii. (1872), p. 571, these asylums are in more need of supervision by a central board than are either the private or public asylums of our own country.

[3] Journal of Mental Science, vol. xii. (1867), p. 138.

[4] The inspection of all state charities by one board here and elsewhere has been used as an argument for merging the Board of Lunacy in Scotland in the Board of Supervision!

[5] The constitution of the Board is given in the above-quoted Report, p. 188.

[6] Second Annual Report of the Massachusetts Board of State Charities, 1866; Introduction, p. xiv.

In the *state of New York*, a similar "Board of State Charities" has recently been established. In certain other states of the Union there is but one inspector of asylums or commissioner in lunacy, *e.g.*, in *Vermont*. The "Commissioner of Insanity" for the state of *California* (Dr Wilkins) last summer (1871) made a tour of inspection of European asylums, including those of Britain. Such tours of inspection are common among American alienists, at the instance, and frequently at the expense, of enlightened governments or boards of managers, when contemplating reforms in their lunacy arrangements, or even when simply desirous of keeping them on a par with modern opinion and modern progress. Thus, besides Dr Wilkins, I have, at Perth, had visits from Dr Pliny Earle, of the Massachusetts State Asylum at Northampton; the Baron Mundy, a self-constituted Austrian lunacy reformer of the most radical kind; Dr Salomon, of the Swedish Central Asylum at Malmö; Dr Manning, of New South Wales, whose name has been already more than once mentioned; besides special public or private commissioners from Russia, India, and other parts of the world.

"The Association of Medical Superintendents of American Institutions for the Insane" fulfils part at least of the functions of a national board of lunacy for the United States, issuing its codes of suggestions or instructions, on the model of which (apparently) the similar codes issued by the Lunacy Boards of the three kingdoms have been framed. They are based in all these cases on the accumulated experience of asylum physicians.

There is a "Board of Commissioners"[3] in *Nova Scotia*, but its constitution and duties place it in the category of the boards of directors of British asylums, or of the Board of Control of the Norwegian State Asylum, rather than in that of British Lunacy Boards. In *Canada* there formerly existed a "Board of Inspectors of Asylums and Prisons." But since the colony was subdivided into the provinces of Ontario and Quebec, or Upper and Lower Canada, separate inspectors of asylums have been appointed for the two provinces. The "Inspector of Asylums for Ontario" makes a report—resembling that of the English and Scotch lunacy commissioners—on the asylums visited, which report—as is common in England and Scotland—is quoted at length in the annual reports of the local institutions. Thus, in the reports of the Toronto Asylum (for 1869, p. 3, and 1868, p. 3) the inspector's report is printed, and the report of Dr Workman, the physician-superintendent, is addressed not to a board of managers or to Government, but to the said inspector. The operations of the Canadian Board inspectors have been severely criticised by the asylum physicians of the United States,[1] and it certainly would appear that Canadian lunacy arrangements for the supervision of the insane illustrate, or have in the past illustrated, the folly of British colonial governments in appointing incompetent persons to unnecessary offices; for it is most unnecessary and most invidious to place over a veteran such as Dr Workman of Toronto, some favourite of the Government authorities, who is probably totally without lunacy experience or other qualifications for so exalted an office.

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[1] I am indebted (I believe) to Dr Edward Jarvis, of Dorchester, Mass., not only for a bound set of reports of the Massachusetts Board of State Charities, but for other publications of the same Board, as well as suites of the annual reports of the various public or state lunatic asylums.

[2] Second Report of Board of State Charities (1866), p. 204.

[3] Report of the Provincial Hospital for the Insane, Halifax, Nova Scotia, for 1869, p. 9.

Of all the lunacy boards, or forms of lunacy board, of which I have knowledge, by far the best is that of *Scotland*. It is to be recommended as a model for the imitation of other countries mainly on the following grounds:—

(1.) The great attention which it very properly pays to the supervision of the insane *not in asylums*.

As I have already explained, I believe the great use of lunacy boards to be the supervision of this class of the insane, whereas in all other countries in which such boards exist in any form, and especially where they consist of only *one inspector* of asylums, so far as I am aware, time is mainly or wholly occupied by the visitation of public asylums, which have local boards of management, and are fully officered by competent persons. In the Scotch board the time of two medical deputy-commissioners is wholly occupied in the visitation of the insane who are *not in asylums*.

(2.) The attention which is given in the Annual Reports (which are much more philosophical or scientific—of higher practical interest—than those of either of the sister kingdoms) to all subjects bearing on the *prevention of insanity*,[2] a matter of infinitely greater importance than the mere supervision of existing asylums, or even the establishment of new ones where they are much needed.

It is sometimes sneeringly pointed out that the labours of the

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[1] *E.g.*, by Dr Gray of Utica, in Journal of Mental Science, vol. x. (1865), p. 585.

[2] This is a subject that has apparently attracted more notice among American than among British alienists. The late Dr Brigham, who was the medical head of the New York State Asylum between 1842 and 1849, directed public attention to it in various of his official reports, *e.g.*, in the Third Annual Report of said asylum (1846), p. 48.

English Lunacy Board have had no effect in checking the progress of lunacy, or of increasing the proportion of recoveries. But if a lunacy board has a proper conception of its duties, if it possess the proper powers, and command the confidence and co-operation of the public, of Government, and of the authorities of local asylums, its efforts certainly *should tell in the course of years* on the rate of production of insanity as well as on the proportion of recoveries and deaths.

(3.) The proportion of paid *medical* labour in the constitution of the Board—out of six commissioners (including deputy-commissioners), four of them being medical.

(4.) The proportion of honorary *legal* members; and the fulness of the secretarial staff.

At the same time I do not profess to regard the Scotch Lunacy Board as perfect, and I have no doubt its members themselves do not claim for it perfection. Nor would I recommend its literal imitation in a young British colony. There is not the least hope, I fear, of any such colony consenting to salary with adequate emoluments four medical commissioners, or to employ a special secretary and staff of clerks for lunacy administration. Nor would such an outlay be necessary or expedient in the early stages of a colony's growth. On the other hand, I have no doubt as to the propriety of the appointment of fully-officered boards in the older of the United States, and in such British colonies as Canada and New South Wales.[1]

Part Second.

REVIEWS.

Seventh Annual Report of the Sanitary Commissioner with the Government of India, 1870. Calcutta: 1871.

Cholera in Southern India. A Record of the Progress of Cholera in 1870, *and Résumé of the Records of Former Epidemic Invasions of the Madras Presidency.* By Surgeon W. R. CORNISH, F.R.C.S., Fellow of the Madras University, Sanitary Commissioner for Madras. Madras: 1871.

Hindu View of Cholera. A Lecture by GOLAUB SING, M.D. London: 1871.

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[1] A lunacy board for New South Wales was strongly recommended by the "Commissioners of Inquiry on the Lunatic Asylums" of that colony, in their Report of 1855, p. 9.

Epidemic Cholera. By EDWARD AMBROSE FITZGERALD, Surgeon Bengal Medical Service. London: 1871.

The Indian Medical Gazette. Calcutta: November and December, 1871.

As usual, Dr Cunningham's Report gives us a considerable amount of fresh evidence, and new information, upon important questions of pathology, collected and stated in a truly candid, scientific spirit. Some improvements have been made in grouping the statistics, for example; and those from the hill stations and convalescent depots have been formed into separate groups.

In some of the hill stations the results compare favourably with those in our own military stations at home. The general mortality of the European force in the Bengal Presidency for the year 1870 is 21·90 per 1000. "As regards mortality," writes Dr Cunningham, "Bengal contrasts most unfavourably with the other presidencies, giving an average death-rate for the ten years of 29·98 per 1000, compared with 21·46 in Bombay, and only 20·27 in Madras. Great portion of the excessive loss is to be ascribed to cholera, which caused an annual average of 9·24 deaths per 1000 in this presidency, compared with 4·80 in Bombay, and 2·56 in Madras; but even excluding the cholera rate, Bengal, with 20·74, still occupies the highest place; then comes Madras, with 17·71; the returns from Bombay, 16·66, being the most favourable of all. The higher death-rate of Bengal is due, as has been already stated, mainly to cholera, but fevers and heat apoplexy both have had a marked influence in the result."

The mortality amongst European children in the Bengal Presidency was rather more than double the mortality of the mean of children of the same age in England.

We have some observations on the development of cystic disease in cattle, and some experiments made by Dr Oliver, which are not likely to be repeated in this country. Pieces of beef, studded with cysticercus, were given to natives of low caste, after explaining to them the probable consequence of eating. The conclusion Dr Oliver arrives at was, that "the safety or otherwise of eating cyst-infected meat simply depends on the manner in which it is cooked. If this meat is thoroughly done, and presents no rawness when cut into, the measles appear like little nodules of coagulated albumen, are doubtless perfectly inert, and may be eaten with impunity."

In the appendix there is a valuable report by Dr Bryden upon the influence of age and length of service as affecting the mortality and invaliding of European soldiers, which is thus summed up by Dr Cunningham:—

"It may be stated, then, as a fact fully proved by statistics, that new regiments contribute to sickness, mortality, and invaliding in a proportion very much in excess of the ratios for those who have been a longer time in India. Whether this is to be attributed to the process of what has been termed acclimatization, or to the inexperience of new arrivals, who are less able to take care of themselves in a new country, or to the fact that the material of which these new arrivals are composed is to a great extent of an inferior quality, which rapidly succumbs to climatic influences,—is a question which cannot be easily determined. But whatever may be the true explanation of the results—and probably they are more or less influenced by all these causes—there can be no doubt that the facts are of great practical importance, and deserve careful consideration, not only in determining how regiments on their first landing may be best cared for, but also how far it may be expedient to garrison India with men enlisted for short periods."

A great portion of the volume is occupied by statistics upon cholera, and no new theory or explanation has been evolved; further evidence is given upon disputed points as to the method of diffusion and pathology of this mysterious disease. Dr Douglas Cunningham, a young officer specially deputed to make investigations upon cholera in India, gives us a report which occupies nearly a hundred pages. It is illustrated by some good engravings from careful drawings of fungi observed under the microscope. The result is entirely negative. No fungus nor other form of vegetable life seems to be peculiar to the dejections of cholera. A number of observations were also made to test Pettenkofer's subsoil theory, but without any definite result.

In reviewing the Sixth Annual Report last year, we pointed out that the theory which seeks to trace all or most cases of cholera to specific contamination of the water-supply, was opposed to some careful observations made in the Punjaub, and this year it may be enough to add Dr Cunningham's appreciation of these and other similar observations.

"On a careful examination of all the facts, I cannot, therefore, admit that there is any evidence to prove that cholera-tainted water was the most influential of all the conditions which favoured the propagation of cholera in the Punjaub in 1869. Much more precise and positive proof must be adduced before this doctrine can be accepted as a truth. That good pure water is one of the most important requisites for health I fully admit, and, as I have frequently urged, there is no more pressing reform required in cantonments, cities, and villages, than the provision of a really good water in ample quality, and defended in every way from impurities; but the value of this reform can be insisted on just as forcibly, and indeed with even greater justice, without attaching to it a theory which, so far as the facts regarding cholera in India are concerned, as yet rest on no basis whatever. Facts may hereafter be adduced to show that this water theory is more or less true; but until such evidence is produced, the assertion that cholera is propagated mainly by cholera-tainted water remains unproved. This is one of the great questions to be investigated by the Sanitary Commissioners with the utmost care and attention; but such an investigation can never be conducted with the hope of any satisfactory results, if it be assumed at the outset that certain theories regarding the disease have already been established as facts—that cholera cannot be diffused except by human agency; that cholera evacuations contain the special virus by which disease is spread, and that this virus acts on any community by gaining access to the water-supply. If the truth of these statements is believed by the inquirer to have been already demonstrated, very little remains for him to learn. But if, on the other hand, he enters on the study of an epidemic with his mind altogether unbiassed, he will find difficulties and anomalies innumerable, which require the most patient and painstaking investigation."

We are glad to perceive that Mr Cornish, as well as Dr Cunningham, has determined not to espouse any particular theory in the meantime, but to aim at faithfully reproducing evidence, and pointing out its bearing upon the diffusion of cholera. It is not because we do not set a value upon the details in Mr Cornish's Report that we cannot enter upon any discussion of them at present. Mr Cornish points out some cases in which he thinks Dr Bryden has mistaken the method of invasion of epidemic cholera into the Madras Presidency. The following paragraphs will give the reader some idea as to the nature of his objections to Dr Bryden's theories about the agency of the monsoons in spreading cholera over India. Before the scientific world can accept a theory that seeks to explain the spread of cholera to places so geographically remote as Peshawer and Singapore by the agency of monsoon winds, it will seek to know something about the direction and rate of progress of such winds in connexion with the progress of cholera. It is manifest that the same winds that take cholera from Bengal to the Punjaub, cannot be instrumental in sowing the seeds of cholera over Burmah and China in the south-east.

"The greatest obstacle to the reception of the monsoon theory of cholera invasion is, I think, the unquestionable fact that cholera is not checked in its movement by the prevalence of a strong monsoon wind blowing against its line of advance.[1] The narrative of Scott of the 1818 epidemic, and the record at pages 18 and 20 of the 1859 and 1864 invasions, are quite clear as regards the movements of former epidemics. The southward and slightly eastward advance of the 1869 invasion in this presidency was certainly not checked by the south-west monsoon, nor did it travel any faster when the monsoon turned round in its favour. That monsoon moisture favoured the multiplication of the cholera miasm is quite probable, but there is no evidence that prevailing winds checked or hurried the invasion. It is a fact, too, beyond all question, that the southward advance of this same epidemic from Tinnevely to Ceylon, in 1870, was not checked by the strong southerly winds then blowing. It follows, therefore, that there is a movement of cholera independently of strength or direction of winds, and that aerial influences cannot be so powerful as indicated by Bryden."

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[1] The reader ought to bear in view that Dr Bryden is of an opposite opinion on this point, interpreting facts in a different way.

The following summary of Mr Cornish's views as to the movement of cholera will, coming from so able an observer, and one who has had so good a field of observation as Mr Cornish, be read with attention :—

" 1*st.* That an epidemic wave from the natural home of cholera reaches the Madras Presidency after affecting the Central Provinces, a portion of the Bombay Presidency and the Deccan, and rarely if ever by the shorter route along the Coromandel coast.

" 2*d.* That these epidemic waves of cholera recur at uncertain intervals, but generally once in four or five years.

" 3*d.* That the direction of the line of cholera advance in this presidency is, generally, from north to south, and that the invading epidemic never entirely halts until the extreme southern limit of territory (including the island of Ceylon) has been reached.

" 4*th.* That the south-west winds do not stop or retard this southern advance, nor do the north-east winds hasten it.

" 5*th.* That monsoon moisture has some relation to the seasonal intensity, and possibly also to the movement of cholera, although prevailing winds do not hurry or check its advance into unoccupied territory.

" 6*th.* That the period of time occupied in the invasion of Southern India has varied from six months to two years.

" 7*th.* That the increased rapidity of communication by railways and steamboats has not hastened the advance of cholera, the last epidemic in 1869–70 having taken four times as long to reach Ceylon as did the great epidemic of 1818."

A Hindu View of Cholera is a very clever pamphlet. Although it only occupies sixteen pages, the author raises so many important questions in so suggestive a manner, that we regret our space does not allow us to follow him out. A few quotations will show that the pamphlet is worth buying and reading.

"A further affinity and resemblance is shown between cholera and the febrile diseases, in the facts, first, that their grander evolution in man, and the general history of epidemics, have but small connexion with contagion; and, secondly, the equal truth, that the earlier cases of these so-called different diseases do show occasional proof of spreading by contagion. The relative proportion in which these two qualities are shown varies in amount; the contagious property (*e.g.*) is high in scarlet fever, low in cholera. A parallel history is seen in disease communicated by poisoned water. The Broad Street, Soho, cholera of 1854, showed cases undoubtedly traced to water contamination; but the greater history of that outbreak was coincident with a general increase of cholera in the metropolis, and was independent of any known poison in water."

Take now the following Hindu view of our sanitary efforts in India:—

"Again as to water, from childhood to old age, we drink of the same tank of surface-drainage water; our fathers see their great-grandchildren around them; nor is cholera associated with such tanks. A hundred million beings throughout their lives drink such water, and such has been the practice for thousands of years. The occurrence of *cholera bears no grand relation to such customs.* Cholera has existed and held a definite course, not yet fully seen or known; but it is quite childish to associate it chiefly with the water drunk. Such reasoning is 'seeking the greater in the lesser worlds.' We ask only the favour that your officers in India do not meddle with our tanks. I have known good tanks spoiled by zealous theorists ordering their cleansing—that is, the removal of the vegetation which grows in them. The women of ancient villages and towns have, for thousands of years, gone down into the tanks, pushed aside the green surface-vegetation from a small space, and drunk water; it is the only water they ever use; it is drunk pure and simple; we are a nation of water-drinkers. Those towns and villages often remain free from cholera for long periods. The 'form' of cholera lies deeper in man's defective composition and correlation.

"Your scientific officers in India, with childlike avidity, seize any obviously associated circumstance, and call it a 'cause of cholera.' This narrow view of a great subject, this ever seeking causes, seems to us one of your greatest errors of method; it is that which prevents your splendid activity and search from having better results; it is why your mighty and systematic labours in building such masses of statistics are almost barren; you want the true 'idea.' . . .

"That quinine, arsenic, iron, etc., are prophylactic of ague is a proof that the disease which they prevent or cure is actually of a series or partship, or relationship in nature, with such substances. With the periods involved, *with the mode of action*, we have no concern; our business is to see facts, and, by analogy and recognised alliances, place our facts in circles of wider generality. We learn from these instances *true* prophylaxis; that is, the 'supplying to the system those elements and correlatives it has lost.'

"However vast the periods, and however involved, under which the system has evolved to the capacity for a diseased relation, we know that the remedy may be but a small quantity of some single element, close at hand; the negro in the West Indies is so correlated to the climate, that his system cannot take on the change, whose symptoms are yellow fever; his co-ordination may have taken ages to grow, but we cannot doubt but that a potential prophylaxis exists, in some single form, which, given to the unacclimatized

European, would effect in a week that which ages have done for the negro. No kind or power of analysis can detect a difference between the vaccinated and unvaccinated, or between him who has had syphilis or typhus and him who has not, or between the acclimatized European and him liable to yellow fever, etc. Yet these changes, infinitely small in amount, are absolutely prophylactic."

Mr Fitzgerald adopts Dr Bryden's theory, that cholera is an air-borne miasma, generated in Lower Bengal, and wafted along by the prevailing winds to Upper India and other distant regions, and declares his conviction that the outbreak of cholera over Upper India and the Punjaub in 1867 had no necessary connexion to the great fair at Hurdwar, from which it was argued that it spread as from a focus. He considers the remarkable immunity of the servants, as well as the patients, from other diseases, in the General Hospital at Calcutta, a sufficient proof of the non-contagious nature of cholera. In this hospital no special precautions are taken to isolate cholera patients, and 1100 cases have been treated during the thirteen years ending July 1868 out of 24,000 European patients. Yet, out of this large number, eight only had been seized with the disease in the hospital, and of these eight, seven had been admitted with diarrhœa. Mr Fitzgerald at one time used the opio-stimulant plan of treating cholera, but at last "was compelled to give it up in sheer despair." Indeed, he considers that many of the worst sequelæ of cholera are at least much aggravated by this plan of treatment. He regards it as a bad sign when the vomiting and purging are suddenly arrested. In treating the disease he uses strychnia and quinine, and administers acid drinks, such as vinegar, lime-juice, or sulphuric acid dissolved in a large quantity of water. Altogether this is a sensible pamphlet, and gives a good deal of information in a readable form.

The numbers of the *Indian Medical Gazette* kindly sent to us by Mr Macnamara, contain an account of a remarkable outbreak of cholera which commenced at Secunderabad on the 24th of May 1870 amongst the 18th Hussars and their wives and children. Eighty-five people out of 549 were seized with cholera, and 39 died. There were two other European regiments, besides artillery, in the station, but they entirely escaped from cholera for nearly a month after, though there were cases in the bazaars. The whole stress of the epidemic fell upon the Hussars during the first two or three days. The regiment had been six years at Secunderabad. It would appear that their health had deteriorated, and that they were living in barracks which had been condemned as unhealthy as far back as 1852. From a careful examination, it was ascertained that they were clean and well drained. Mr Macnamara regards this as a case where the water-supply was poisoned with cholera dejecta. There is, however, no evidence of such an occurrence, unless we are content to hold the outbreak itself as sufficient proof.

Lectures on the Principles and Practice of Physic, delivered at King's College, London. By Sir THOMAS WATSON, Bart., M.D., F.R.S., etc. The fifth edition, revised and enlarged. London: Longmans, Green, and Co.: 1871. 2 vols., pp. 1980.

The Science and Practice of Medicine. By WILLIAM AITKEN, M.D. Edin., etc. The sixth edition, greatly enlarged, remodelled, revised, and many portions rewritten. London: Charles Griffin and Co.: 1872. 2 vols., pp. 2234.

A System of Medicine. Edited by J. RUSSELL REYNOLDS, M.D., F.R.S.E., etc. Vol. III. London and New York: Macmillan and Co.: 1871. P. 995.

WE have the highest authority for stating that it is impossible to put new wine into old bottles without injury to the latter, and though it may seem somewhat derogatory to Sir Thomas Watson to liken his work to a "leathern bottell," the comparison nevertheless holds good. More than thirty years have elapsed since first these lectures were delivered, and nearly thirty years since they were first published in a connected form, while it is quite fourteen years since the last edition was given to the world. During the long period of time which has elapsed between the issue of the first and of the fifth editions of this work, a whole generation has passed away, and the changes which have taken place both in the science and practice of medicine have been indubitably—for various reasons which are self-evident—more important and more extensive than have ever previously occurred. Under these circumstances it would be expecting a miracle to suppose that any man, however learned, logical, and unprejudiced, could so far forget or ignore the tuition of his youth and the acquirements of his riper years as not to endeavour to mingle the old with the new, and so form a patchwork admirable in proportion to the skill of the author and the raciness of his language, but defective in truth in proportion to the deviation originally made from that basis from which both new and old are derived. If any one at all conversant with the modern pathology of inflammation and its results, as contained in the writings of Lister, Virchow, Cohnheim, Stricker, etc., as well as with its modern treatment, will take the trouble to compare the chapters on this subject in the present edition with those on the same subject in the last edition, he will be at no loss to perceive the difficulty that has been felt in attempting to reconcile old beliefs with new doctrines, and he will also fully recognise the futility of the attempt. In one respect Sir Thomas Watson's work may be regarded as in advance of the age, inasmuch as he has unreservedly accepted Dr George Johnson's theory both of the pathology and treatment of cholera. This perhaps is hardly to be wondered at, considering the intimate relations between the two men, and the fact that Dr Johnson has largely assisted in the re-editing of this work. Dr Johnson's method of treatment has, however, signally failed in every quarter of the globe, even when tried by those most anxious to do it justice and sanguine of its success, while his pathological theory is, as we have already shown (June 1867, p. 1111), unsound as to the supposed facts upon which it is based, and still more unsound in the ratiocination upon these facts. We regret that Sir Thomas Watson has seen fit to adopt Dr Johnson's views, and thus to mar the usefulness of a work which in some respects is unrivalled: its fluency and beauty of language make it as delightful to read as a standard novel; while it is perhaps not the less suited for a text-book, that the views enunciated must sometimes come into collision with those taught,—for the true object of tuition is not to cram with certain dogmata, but to educate, by drawing out the faculties of observation and reasoning in those taught.

Fourteen years ago Dr Aitken published a very meagre and unsatisfactory text-book, consisting of 756 pages, from which many important subjects were wholly omitted; it has now reached its sixth edition, and comprises upwards of 2000 pages, from which no subject of any importance has been omitted, and which contains very much in relation to pathology and diagnosis which will be in vain sought for in any other text-book in any language, and which indeed is only elsewhere to be found in separate treatises. It is by no means light reading; the tomes are large, their contents weighty, and the manner of presentment inartistic and heavy; nevertheless there is perhaps no work in the English language more indispensable for the practitioner and student. From his position, as Professor of Pathology in the Army Medical School, what may be termed military medicine and pathology, naturally bulk largely, but the diagnosis of the various diseases is no less effectively put, and all the modern means and appliances to that end are duly described and considered; and if his chapters on treatment read somewhat like extracts from Waring, they err mainly on the side of fulness, and are only deficient in that generalization which is not to be acquired but by long practical experience in the treatment of disease,—a defect which is supplied by the teacher to the student, and which is in a great measure rectified by the personal experience of the practitioner himself. We have great pleasure in recommending Dr Aitken's work as a very full exposition of the present state of the science and practice of medicine, though the views propounded—as, for instance, those bearing on the pathology of inflammation and of nervous diseases—are not always of the most advanced type; and we hope that in the future the author will, by alteration, condensation, and rearrangement, endeavour to make his work more accurate and readable, without impairing its utility.

The third volume of Reynolds's System of Medicine completes the section on Diseases of the Digestive System, and includes an account of diseases of the respiratory system. As might naturally be expected in a work embracing such a variety of contents, it contains papers of very varying importance; while from the number of authors employed, some divergence of opinion has of course been inevitable. It is, of course, the duty of the editor to see that this obtrusion of individual opinion is not so excessive as to deprive the work of its true cosmopolitan character as an exponent of the views presently held in regard to pathology and therapeutics. The preface we think sufficiently indicates the doubts which the editor himself has as to the manner in which this duty has been discharged in regard to at least one of the subjects discussed; we confess to sharing these doubts. But with this exception, and excepting also the fact that one or two short articles have been introduced upon unimportant subjects which would have been better treated in subordinate paragraphs, under a more general heading, we think this volume fully maintains the high character which the work generally is already well known to possess.

On Clinical Education. By FURNEAUX JORDAN, F.R.C.S.: Being the Introductory Address to the Clinical Session, 1871-2, at the Queen's Hospital, Birmingham. London: J. and A. Churchill.

INTRODUCTORY addresses are almost invariably trite and commonplace. This can hardly be avoided; and the only consolation is that their triteness, which wearies those who have to read them, having read many before, is probably freshness, novelty, and delight to one set at least of the hearers—the first-year students, who, with note-book and pencil, endeavour to appropriate the salient points of the address, and probably remember much of it to the end of their lives.

This lecture is one that must have left some trace on the hearers' memories, as it is terse in expression, tolerably original in thought, and here and there almost epigrammatic. We rejoice to see that Mr Jordan encourages question and answer. "The pupil should not let his teacher look at, or touch, or say or do anything without asking the reason why—without eliciting the principle which guides the look or touch or question," p. 10. One or two good aphorisms we may quote. "The man who is indifferent to pathology is dead to science: he is a retailer of remedies, and an empiric in the worst sense," p. 11. "The ignorant cannot distinguish the momentous from the insignificant." "Work is the first and greatest element of success." "Work at difficulties: easy things take care of themselves."

We congratulate Mr Jordan on having got over his inaugural address, which ought to be a thing done only once in a lifetime; for, from personal experience, we can say, having written one, there really can be nothing left to put in a second.

Fecundity, Fertility, Sterility, and Allied Topics. By J. Matthews Duncan, A.M., M.D., L.R.C.S.E., F.R.C.P.E. and F.R.S.E., Lecturer on Midwifery in the School of Medicine; Physician for Diseases of Women to the Royal Infirmary; Physician to the Royal Maternity Hospital, etc.

We welcome with pleasure a second edition of a work which is already out of print, and which is so replete with vast funds of material interesting and useful alike to the scientific obstetrician, to the physician, the physiologist, and the political economist. This edition is, in a great measure, merely a reprint of the former, published in 1866, with some important additions in the form of footnotes. But, besides this, we have added to the body of the work a good deal of new matter, which appeared for the first time in the author's recent volume on the "Mortality of Childbed and Maternity Hospitals;" and also a new chapter on the "Practice of Predicting the Day of Confinement," which has already appeared in the pages of this Journal. By far, however, the most important and the largest contribution of original material to the present volume partakes of a somewhat novel character, consisting as it does of a reprint from the *North British Review* of almost the whole of a critical article upon the first edition of this work. This article extends over 65 pages of the work, and as the total amount of new material in the present edition fills only 120 pages, it therefore is page by page really more than half of the new matter added. Now, though angry people might be inclined to carp at this confessedly uncommon method of book-making, we unhesitatingly affirm that, in introducing this paper, Dr Duncan has made a very valuable addition to his work, and has conferred a great boon upon his readers. The article referred to is an exceedingly able and lucid exposition of the most difficult portions of our author's work, and, in truth, adds to it a not inconsiderable amount of really new, interesting, and valuable matter, both speculative and statistical. More especially will, we imagine, most of the readers of the work consider that portion of this criticism which deals with Professor Tait's mathematical contribution to the volume before us as peculiarly valuable, since the writer lays before his readers the general drift of the Professor's section, but in doing so adopts a much less abstract and, consequently, much more readily understood method. The critic, though on the whole exceedingly favourable to Dr Duncan's views, yet differs from him in regard to the cogency of some of his deductions from his tables. More particularly is this the case in regard to the conclusion which Dr Duncan is led to draw from his tables in the early part of his work bearing upon the question of relative and initial fecundity, to the effect, that while the wives-mothers in the first quinquenniade of childbearing life (fifteen to nineteen inclusive) are more fecund as a mass, the fecundity of the individuals follows a different law, and attains its maximum in the next quinquenniade (twenty to twenty-four inclusive). This difficulty has been already referred to at considerable length in the original notice of the work in the Journal for January 1867, so that we can only recur to it very briefly. Suffice it to say, that in this point Dr Duncan is at variance with Tait's first law, that "fecundity at various ages is proportional to the number of years a woman's age is under fifty," and that, the author's statistics and reasoning notwithstanding, we do not think that he makes it at all clear or probable that the greater intensity of fertility in those wives-mothers fertile during the first quinquenniade of married life would account for the proved greater fertility of the mass of wives during this period, if the individuals were not also more fecund. The reviewer explains to our mind most satisfactorily the source of Dr Duncan's error to lie in his tables of common, and more particularly of initial, fecundity during this period, failing to give account of the fecundity, or liability to become pregnant, of those wives-mothers who, while married within the first period of five years, do not give birth to a living child till one or two years into the second period. These wives-mothers, though strictly belonging to the first period, are by Dr Duncan's tables classified along with the second, and consequently augment the apparent fecundity of the second period, whilst they diminish that of the first period. We fully expect that when Dr Duncan finds leisure, which he expresses the hope to, for reconsidering this whole matter with better data, his final conclusions will be quite different from his present, and will show, in accordance with Tait's laws, that both the fecundity and fertility of the individual and of the mass begin as maxima at the commencement of childbearing life, and gradually become less as age advances. But this writer makes altogether an exhaustive analysis of the main features of Dr Duncan's work, leaving very little indeed to be said regarding it without repetition, so that our task is rendered almost unpleasantly easy. Besides discussing the merits of our author's views, the critic incidentally strikes out upon new trains of thought which are suggested during the discussion, for which we beg to refer the reader to the article itself, certain that it will well repay perusal. More particularly we would instance his remarks upon the propriety of the parents of idiots ceasing by abstinence to be the means of bringing more such wretched beings into the world, as the chances are that when idiots are once produced the subsequent children will be similarly affected; the importance of instructing young people of both sexes more completely regarding the possible consequences and risks entailed by them in entering upon the married state, so as to prevent disappointment afterwards; his discussion of the bearing of the known laws of fecundity and fertility upon the propriety or otherwise of early marriages.

Professor Tait, in his portion of the work, brings forward some valuable new tables relative to the average actual fertility of married women in England, Scotland, Ireland, and Sweden, which appear to him to show that, taking the fertility for Scotland at 100, that for England is 86, for Ireland 98, and for Sweden 117. This is additional proof of the existence of a marked discrepancy in regard to the fertility of married women in England and Scotland, which, considering the almost identical circumstances and conditions of the two nations, is equally curious and inexplicable.

In his chapter upon the "Practice in the Prediction of the Day of Confinement," a subject very useful to the obstetrician, our author discusses, and we think successfully controverts, the recently advanced views of Dr Ahlfield in favour of limiting the ordinary period of pregnancy in the human female to 271 days. Dr Duncan, while pointing out the impossibility of arriving at accurate knowledge of the duration of a state the commencement of which it is impossible to determine with certainty, since we can never ascertain the exact period of conception, declares himself as still favourable, from his examination of the statistical data bearing upon the point, to the view that the natural average time of duration of pregnancy is most probably nearer to 275 days—the period long ago assigned to it by Harvey—than to 280 days, the period which has hitherto found most favour in this country, and was so ably advocated by Montgomery. Proceeding on this hypothesis, Dr Duncan's method is directed, when taking the disappearance of the catamenia as the point of departure, to ascertain the 278th day from the conclusion of the menstrual period, as he finds from his data that 278 days make up the most common average period between the disappearance of the menses and the supervention of labour, three days or more being required for the interval between insemination and impregnation. This he recommends to do by fixing upon the same day of the ninth calender month, counting onwards from the date of disappearance of the catamenia, and adding three or five days to the date thus found, according as the period excludes or includes February, so as to determine the most probable day of the supervention of labour. But he does not fix this day as the middle of the week, as is usually done, but the middle of the fortnight.

The most curious and important bearing of this method is, however, the fact, that when the results of its application to 153 carefully observed cases by Dr Duncan have been tested by Professor Tait according to the law of probable error, they very nearly satisfy the requirements of the law; or, in other words, the avoidable errors are nearly eliminated, and the method shown to be about as perfect as the conditions of the problem will allow of.

Considering the annoyance that miscalculation in this matter so frequently entails upon both patient and doctor, every contribution proposing to diminish the chances of mistake is very acceptable to those members of the profession engaged in obstetric practice, and ought to be put to the test of experience.

Of nearly the whole of the other portions of this work we have already had opportunity to express our opinion, either when noticing in the Journal the first edition of this work, or that on "Mortality of Childbed and Maternity Hospitals." And besides, as we have already stated, the critical article embodied in the book treats of almost every point in it which is legitimate subject of criticism—such, for example, as Table XL., which we had marked for notice in reading the work, wherein the author, from the difficulty of obtaining sufficiently accurate data, is led to deduce the average interval between marriage and the birth of a first child in the case of wives married at different ages in months, whilst his original data takes in no lower units than the year. Clearly, the omission of fractions of the year in the data, however difficult it is to obtain such, cannot but convey a very great degree of inaccuracy to the result, and make the table only a very wide average guess.

However much objection may be raised against the more strictly scientific or first part of the work, it must clearly be set down to the scanty sources of the supply of the data, and all must allow that the author has made the very best of the material which he had within his reach, and must admire the spirit of fairness and scientific thoroughness with which the numbers are collated, combined, and interrogated from so many different points of view, without any attempts at forcing from them conclusions other than those which they legitimately warrant.

The part of the work bearing upon Childbed-mortality and the Mortality of Puerperal Fever, etc., cannot be said to be executed with the same convincing accuracy as the first part of the work. But this is referable to the nature of the subjects, and not to the author's method of treating them. We apprehend, however, that much more has to be done in this department before the author's views obtain the hold upon the profession which their merits entitle them to. There is such a tendency in the professional mind unconsciously to over-estimate success and under-estimate failure, that when brought face to face with hard facts men are apt to use the old argument—"So much the worse for your facts."

But we must conclude, by expressing our high estimate of the value and importance of the work as a whole, which all will, we think, allow to be the production of one of the most philosophical and scientific living writers upon obstetrics and subjects thereto allied of whom these islands can boast.

Die Lehre von den Zwillingen. Von LUDWIG KLEINWAECHTER. Prag: Haerpfer: 1871.

A Treatise on Twins. By LUDWIG KLEINWAECHTER. Prague: Haerpfer: 1871.

Dr KLEINWAECHTER is already known to us by his paper on spontaneous evolution. This is a record of experience in the lying-in hospital of Prague, and the remarkable and novel facts and views which it lays before the obstetrical profession are well worthy of consideration from their theoretical and practical value.

The same author, proud of belonging to the great and famous Prague School of Midwifery—and justly proud, if all we hear of it be really true—now comes before the profession with a valuable monograph on twins, which he dedicates to his master the late Seyfert, Professor of Midwifery there.

It is an old idea with us, which we never despair of realizing, that no subject is more tempting for a monograph than that of twinning. As a fine landscape may contain a great variety of scenery, so this topic contains theory and practice; physiology, pathology, and therapeutics. The treatise of Kleinwaechter is a valuable contribution to this subject. It is not exhaustive, however, as its German origin may lead many to suppose. There is still ample room and range enough for a larger and grander monogragh; and this circumstance is no discredit to Kleinwaechter, who seems aware that he might have made more of the subject. As it is, Kleinwaechter's book is very useful, and should be studied by all interested in obstetrics.

The subject is divided into thirteen chapters, which give a good idea of the scope of the work. They comprise the frequency of twins, their production, and the structure of the afterbirth; the production of monsters, especially those produced by coalescence; twinning in malformed uterus, superfecundation and superfetation, twin pregnancy, disturbance of twin pregnancy, birth of twins, treatment of natural birth of twins, birth of twins with long intervals, disorder in the course of twin births, birth of double monsters and malformed twins, weight and development of twins, prognostics for mother and child in twin cases.

On the Pathology and Treatment of Gonorrhœa. By J. L. MILTON, Surgeon to St John's Hospital for Diseases of the Skin. London: Hardwicke, 192 Piccadilly: 1871.

THIS work is a revised and abridged edition of a work which was reviewed in our pages when it first appeared, but it contains a large amount of new material.

It is useful as giving a sort of bird's-eye view of the various plans of treating gonorrhœa from the days of Sydenham downwards, with some carefully-constructed tables illustrating the results of the different methods of treatment.

The author's own method of abortive treatment in cases which admit of such management is: 1. A carefully-given injection of nitrate of silver, five grains to the ounce, allowed to remain in the urethra for several minutes; 2. A calomel purge, followed by purgative salts, till several loose stools are induced—very little diet to be given, except warm tea and gruel; 3. After each stool an injection of sulphate of zinc, three to five grains to the ounce; and after each injection the penis should be bathed in warm water as hot as can be borne; 4. The injection to be gradually strengthened up to ten grains to the ounce.

In cases which do not admit of abortive treatment—and these are all cases, except very few—he orders a new prescription, which he considers of great value, consisting of acetate of potass, in combination with spirit of nitric ether, given in compound spirit of juniper and peppermint water. For quantities, merits, etc., we must refer to the work. This is to be combined, in some cases, with the use of injection, *given by the surgeon himself*, and gradually increased in strength as required.

A curious and laboriously-compiled table, illustrating the relation of orchitis to weather, has a certain amount of interest, if not much practical value.

On Dactylitis Syphilitica; with Observations on Syphilitic Lesions of the Joints. By R. W. TAYLOR, M.D. Reprinted from the *American Journal of Syphilography and Dermatology.*

WE do not often notice mere reprints; but this is a very carefully done monograph on a rare lesion—the information regarding which is drawn partly from the author's own observations of cases, and partly from the descriptions of some Continental surgeons. The descriptive and pathological part is better done than the practical, the diagnosis and treatment receiving only two pages out of the thirty-two of which the pamphlet is composed.

Darwinism: Being an Examination of Mr St George Mivart's Genesis of Species. By CHAUNCEY WRIGHT, Esq. London: John Murray.

MR MIVART'S book has, from the position and well-known ability of the author, attracted more than the usual share of criticism that falls to the lot of most writers on this subject. Bringing forward difficulties which do not at once occur to the minds of many who were previously inclined to accept the theory of natural selection, there can be no doubt that its tendency was to shake the faith of such in the stability of a theory which has undoubtedly been gaining ground rapidly of late years. The author of the pamphlet now before us, who is evidently a disciple of Mr Darwin, attempts, and, as we think, successfully, to demonstrate the fallacy of many of Mr Mivart's arguments. The Examination is ably conducted by one who has evidently devoted much time and attention to the consideration of the theory of natural selection.

The subjoined extract will put the reader in a position to judge for himself of the style of our author, and may, perchance, enable some, burdened with the weight of current theological misrepresentation, to perceive that the reception of the theory of natural selection does not necessarily imply abandonment of faith in the existence of the Deity:—"Mr Darwin has not, in his works, repeated with sufficient frequency his faith in the universality of the law of causation, in the phenomena of general physiology or theoretical biology, as well as in all the rest of physical nature. He has not said often enough, it would appear, that in referring any effect to 'accident,' he only means that its causes are like particular phases of the weather, or like innumerable phenomena in the concrete course of nature generally, which are quite beyond the power of finite minds to anticipate or to account for in detail, though none the less really determinate or due to regular causes. That he has committed this error appears from the fact that his critic, Mr Mivart, has made the mistake—which nullifies nearly the whole of his criticism—of supposing that the theory of natural selection may (though it need not) be taken in such a way as to lead men to regard the present organic world as formed, so to speak, *accidentally*, beautiful and wonderful as is confessedly the haphazard result' (p. 33). Mr Mivart, like many other writers, seems to forget the age of the world in which he lives, and for which he writes, the age of 'experimental philosophy,' the very standpoint of which, its fundamental assumption, is the universality of physical causation. This is so familiar to minds bred in physical studies, that they rarely imagine that they may be mistaken for disciples of Democritus, or for believers in 'the fortuitous concourse of atoms,' in the sense, at least, which theology has attached to this phrase. If they assent to the truth that may have been meant by the phrase, they would not for a moment suppose that the atoms move fortuitously, but only that their conjunctions, constituting the actual concrete order of events, could not be anticipated except by a knowledge of the natures and regular histories of each and all of them—such knowledge as belongs only to omniscience. The very hope of experimental philosophy, its expectation of constructing the sciences into a true philosophy of nature, is based on the induction, or, if you please, the *a priori* presumption, that physical causation is universal; that the constitution of nature is written in its actual manifestations, and needs only to be deciphered by experimental and inductive research; that it is not a latent invisible writing, to be brought out by the magic of mental anticipation or metaphysical meditation. Or, as Bacon said, it is not by the 'anticipations of the mind,' but by the 'interpretations of nature,' that natural philosophy is to be constituted; and this is to presume that the order of nature is decipherable, or that causation is everywhere either manifest or hidden, but never absent."

One other extract must suffice. Speaking of the variability of animals under domestication, our author expresses himself as follows:—"Mr Mivart says, 'Mr Darwin abundantly demonstrates the variability of dogs, horses, fowls, pigeons, but he none the less shows the very *small extent* to which the goose, the peacock, and the guinea-fowl have varied.' Mr Darwin attempts to explain this fact as regards the goose, by the animal being valued only for food and feathers, and from no pleasure having been felt in it on other accounts. He adds, however, at the end, the striking remark which concedes the whole position, 'but the goose seems to have a *singularly inflexible organization.*' The translation is begun in the author's italics, and completed a few pages further on, where, recurring to this subject, he says:—'We have seen that Mr Darwin himself implicitly admits the principle of specific stability, in asserting the singular inflexibility of the organization of the goose.' This is what is called in scholastic logic, *Fallacia a dicto secundum quid ad dictum simpliciter.* The obvious meaning, both from the context and the evidence of the expression 'singularly inflexible,' is, that the goose has been much less changed by domestication than other domestic birds. But this *relative* inflexibility is understood by our author as an admission of an *absolute* one, in spite of the evidence that geese have varied from the wild type, and have individual differences, and even differences of breeds, which are sufficiently conspicuous even to the eye of a goose."

Enough, we trust, has been said to show that Mr Wright's review will repay careful perusal. We recommend it to the attention of those interested in the subject.

A Review of Darwin's Theory of the Origin and Development of Man. By JAMES B. HUNTER, M.D. New York: Appleton and Co.

THIS Review appeared originally in the Journal of Psychological Medicine. Occupying nearly twenty pages of print, the reader will find in it a very careful and condensed abstract of Mr Darwin's last work on "The Descent of Man." The author does not appear to have any opinions of his own on the subject; if he has, he avoids expression of them.

An Introductory Text-Book of Zoology for the use of Junior Classes. By ALLEYNE NICHOLSON, M.D., D. Sc., etc. Edinburgh: Blackwood and Sons.

THIS is an excellent little work, the value of which school teachers will not be slow to appreciate.

Written throughout clearly and concisely, with a careful avoidance of all unnecessary detail, it cannot fail to be largely made use of as a text-book at a time when natural science is regarded as one of the essential branches of education in almost every school. The matter throughout is thoroughly reliable, and, so far as consistent with the strictly elementary character of the work, brought up to the present state of the science. It has, moreover, the advantage of being profusely illustrated.

The importance of a work such as this, in the diffusion of accurate notions regarding the structure and classification of the animal kingdom among the people, cannot be over-estimated. We hope, before long, to see it in general use.

Part Third.

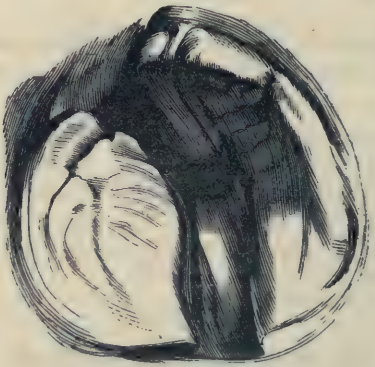
MEETINGS OF SOCIETIES.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXI.—MEETING VI.

Wednesday, 14*th February* 1872.—Dr MATTHEWS DUNCAN, *Vice-President*, in the Chair.

I. *Dr James Young* exhibited a CAST OF CONGENITAL MALFORMATION OF THE PALATE AND SUPERIOR MAXILLARY BONE. In this case the cast was taken by Mr Wilson, dentist, with considerable difficulty, the child being only six weeks old at the time.



There is a deficiency of the right side of the palate, consisting of a long deep fissure running through it, terminating anteriorly in a wide notch of the superior maxillary bone, about an inch in breadth, with complete hare-lip, opening into the nostril of the same side. The child was born at the full term of gestation, and appeared otherwise healthy and well developed, though somewhat weakly. In this case the child can suck, and is thriving well, being able to compress the nipple between the tongue and half of the hard palate.

II. *Dr Bell* read the following paper by Dr S. Lawrence, Montrose, entitled A CASE OF LARGE CONGENITAL CRANIAL TUMOUR:—

It may not be without interest to the members of the Edinburgh Obstetrical Society to have briefly submitted to their notice the particulars of a very rare congenital tumour, which operated as a cause of difficult labour in a case which recently occurred in my practice.

On the 22d November last, I was called about noon to attend Mrs A., aged 43, in labour with her sixth child. I had attended her in all her previous labours, which were not only unaccompanied with any difficulty, but exceedingly easy and expeditious. Seven years had elapsed since her last confinement. On my arrival I found that the liquor amnii had been discharged early in the day, that the os uteri was rather more than half dilated, and that the pains were unfrequent and feeble. I could not at first fully satisfy myself as to the presenting part of the child, as it lay so high in the pelvis, and, so far as it could be felt, seemed so devoid of the ordinary globular contour of the fully developed fœtal head. In the course of an hour, however, all doubt on this point was set at rest by the left ear coming within reach of the finger. Shortly after three o'clock P.M., as the pains were somewhat feeble, I administered a dose of infusion of ergot, which by-and-by had the effect of increasing both their strength and frequency. Notwithstanding this, the descent of the head was extremely slow, which, considering its felt smallness, and Mrs A.'s former easy confinements, seemed to me somewhat puzzling. On making another examination, and passing my finger along from the vertex to the occiput, I came upon a soft bulging structure apparently connected firmly with the head, and extending up into the pelvis farther than I could trace it. That this was some morbid development seriously hindering the delivery of the child there could be no doubt. But having never, during an obstetric experience extending over more than thirty years, encountered any similar cause of difficult labour, and being unable to call to mind any recorded case resembling it, I was rather perplexed, both as to the nature of the structure and the proper course to pursue under such novel circumstances. Failing the powers of nature to accomplish delivery after putting them fairly to the test, it seemed to me that I must either then have recourse to the forceps, or attempt to effect a diminution of the attached tumour by puncture. Cephalotripsy also claimed to be regarded as a possible and unavoidable necessity, but evidently only if these other expedients proved abortive. By half-past four o'clock, the pains having been for some time pretty strongly expulsive, and the further progress of the head apparently arrested, I began to make the needful preparations for the application of the forceps, which I had resolved on as my first mode of attempted operative help. I had just taken one of the blades into my hand, with a view to its introduction, when a powerful pain expelled a large morbid mass, which was followed almost immediately after by the head of the child, to which it was attached, and within a few seconds more by the entire body. It would not be easy to convey by any description a correct idea of the very extraordinary appearance which the child, as now seen in its entirety, presented. The body and limbs were those of a child at the full period of pregnancy, the head and face being disproportionally small, as if arrested in their development between the sixth and seventh months. But the most remarkable phenomenon was the tumour above referred to. It was a large pear-shaped pendulous mass, springing from the upper and posterior part of the head, and falling down over the occiput and superior portion of the neck—a truly rare and curious *chignon* of nature's own handiwork. It was about six inches in length, at its neck about the thickness of an ordinary wrist, its greatest breadth being between four and five inches. Over a considerable part of its surface, especially towards its most depending portion, it presented a deep livid hue, not unlike what is met with in spina bifida. I regret that I was unable to do more than make a very hasty examination of it. The child, a female, was born dead (apparently it had died during delivery), and it was needful to excise or amputate this morbid appendage, to permit of the nurse rightly performing her task of dressing and *laying out* the body. This operation was performed *sans ceremonie*, by the readiest domestic instrument that came to hand, and I was thus enabled, although cursorily, to inspect the substance of the tumour, and ascertain its attachments. When cut into, it presented an appearance which, in colour and consistence, will be best described by likening it to softened placenta. In different parts of it were cells or cavities (without, however, any lining membrane) filled with bloody serum. There was a free communication between the interior of the tumour and the cavity of the cranium through the posterior fontanelle, over which it was implanted, and which was decidedly of more than usual magnitude. It would have been of much interest to have carried the examination farther, so as to ascertain both the minute structure of the tumour itself, and the state of the brain as to development and normal condition. But under the circumstances of the case, I was reluctantly compelled to remain satisfied with what I had observed in the hurried inspection I had made. And had it been practicable, which I regret it was not, to have obtained a photograph of both child and tumour *in situ*, I need not say how much I would have been thereby aided in my present attempt to convey to others a correct idea of their remarkable appearance. I am disposed to regard the case now briefly narrated, as probably unique in its character, having been unable, so far as my research or inquiry has extended, to find on record any one bearing a remote resemblance to it. In the *Edinburgh Medical Journal* for March 1867, a case is given by Dr Cappie, which was brought by him under the notice of the Obstetrical Society, of a large congenital cystic tumour, which he met with in his midwifery practice, occupying the left side of the neck of the child, and extending from the ear to the clavicle. Not only, however, did that tumour present no impediment to the progress of labour, but in its attachments and general character it was entirely different from the one now described. There will very probably exist a diversity of opinion as to the precise class or kind of morbid formation, to which the one it was my experience to meet with ought properly to be referred. But its attachment to the cranium, its communication with the cranial cavity through a preternaturally large posterior fontanelle, implying arrest of the ossific process in the parietal and occipital bones, the large quantity of sero-sanguinolent fluid found throughout much of its interior, and the peculiar purplish hue of its integumentary covering, all seem so many points in its history, indicating a close analogy between it and ordinary spina bifida. And viewing it in this light, it is perhaps not too fanciful to regard it as pathology coming forward to countersign and authenticate the modern doctrine, which represents the cranial bones in their aggregate and arrangement as constituting merely an expanded vertebra.

By way of concluding the history of the case just recorded, I may farther remark, that on interrogating my patient as to whether there had occurred anything peculiar in her condition or feelings during the course of her pregnancy, which might plausibly be looked upon as either cause or effect of this remarkable morbid development, I was informed by her, that the only noticeable circumstance was the unusual strength and liveliness of the fœtal movements.

Dr Keiller said he had communicated a somewhat similar case to the Society some years ago. The tumour hung down the back and was covered with skin; he tried to excise it at its narrowest part, namely, at the base of the occipital bone; on cutting into it, however, he found that there was a cyst within a cyst, and he had to give up the operation. The child died the following day in convulsions. These cases differ from anencephalous ones, in having all the bones of the head developed.

Dr Ritchie remarked that this case was quite distinct from the one recorded by Dr Cappie, where the tumour was on the neck, and had no communication with the cranium.

Dr Bell mentioned several cases of a like nature, which are described by Dr Home in his System of Surgery.

Dr Matthews Duncan said that numerous cases of the kind had been recorded by various authors, and that he himself had seen several. In one case, the tumour was the size of an orange, and hung from one side of the head. The child lived for several days. In another, the child lived for a week; the cyst was tapped, and the fluid, a few hours after being drawn off, was found to be full of vibriones. The tumour, which was as large as the head, was a true brain cyst, and extremely thin. The cyst communicated by the aqueduct of Sylvius with the brain.

III. A CASE OF SMALLPOX FROM AN OBSTETRICAL AND MEDICO-LEGAL POINT OF VIEW, by Dr Rattray, Portobello.

After remarks by several of the Fellows, the Council were instructed to draw up a report on the case.

Report by Council.—In regard to the case read to the Society by Dr Rattray on 14th February 1872, the Council beg to report as follows:—

Your Council understand that the charge against Dr Rattray was, that he used a public conveyance for a patient who it was suspected might be suffering from incipient symptoms of smallpox. It was stated to the Society that no appearance of eruption was seen till the day after that on which the conveyance was used. Under these circumstances, it is the opinion of the Council that Dr Rattray could not have known that the patient was labouring under smallpox, and that, therefore, such a charge against him could not be well founded.

The Council recommended the Society to express sympathy with Dr Rattray in the painful position in which he has been placed by the charge against him, which they, on the grounds above stated, regard as unjustifiable.

Part Fourth.

MEDICAL NEWS.

MEETING OF THE GENERAL MEDICAL COUNCIL.—The fifteenth session of this Council was opened at 2 P.M. on Thursday, 29th February, at 32 Soho Square—the President, Dr Paget, in the chair. There were also present, Dr Bennett, Mr Quain, Dr Acland, Dr Humphry, Dr Embleton, Dr Storrar, Dr Alexander Wood, Dr Andrew Wood, Dr Fleming, Dr Macrobin, Dr Thomson, Dr A. Smith, Mr Hargrave, Dr Leet, Dr Apjohn, Sir D. Corrigan, Bart., Dr Quain, Dr Sharpey, Sir W. Gull, Bart., Dr Parkes, Dr Stokes, and Dr Francis Hawkins, Registrar. Sir Robert Christison was prevented by illness from attending this session of the Council. The President delivered his opening address, in which he stated that the Council had been called together at this unusual and inconvenient season in accordance with their own order, made on 10th July last, to receive the proposals of the bodies for conjoint examination, and to consider what steps, if any, should be taken to carry out the resolution of the Council in favour of such combinations. In deference to the presence of a recently elected member, the President then went over the various steps taken by the Council in regard to this matter, which we need not recapitulate. The Business, Finance, and Registration of Medical Students Committees of last year were then unanimously re-elected. The Returns of the Army Medical Department were then received, and, on the motion of Dr Alexander Wood, remitted to a committee. The Registrar then read a correspondence with the Home Office in relation to the case of Mr Kempster, considered at the last meeting of the Council, in which the Home Secretary expressed his intention of introducing a bill to amend the law in regard to Death Registry. The Registrar then read replies in regard to the formation of conjoint examining boards from the national examining bodies; the Royal Colleges of Physicians and Surgeons of London agreeing to a scheme of conjoint examination for a double qualification, which is adopted unreservedly by the Universities of Oxford, Cambridge, and Durham, but protested against by the Society of Apothecaries of London, and also objected to by the University of London, on account of legal difficulties in the way. After two hours' discussion, the following motion by Dr Thomson was agreed to:—"The Council approve of and sanction the conjoint scheme of examination submitted by the Royal College of Physicians of London, and of the Royal College of Surgeons of England, to which the University of Oxford, Cambridge, and Durham have given their adhesion; the Council have at the same time to express the desire that means may be found by which the University of London and the Society of Apothecaries may be enabled to join in the scheme so as to render it a complete scheme for a conjoint board for England." A communication was then read from the Commissioners in Lunacy, regarding the illegal detention for several days of a private female patient in a lunatic asylum, on the certificate of a Dr J. D. Blake of Taunton, who was not registered according to the Medical Act, and a motion by Sir D. Corrigan was carried, "That the attention of the Commissioners be drawn to clauses 38 and 40 of the Medical Act (1858), under which it is declared that no certificate required by any Act now in force shall be valid, unless the person signing the same be registered under that Act, and that 'any person who shall wilfully pretend to be, take, or use the name and title of a physician, etc., shall, upon a conviction for any such offence,' pay a sum not exceeding twenty pounds." The Solicitor of the Council (Mr F. W. Farrer) was, on the motion of Dr Bennett, directed to take the necessary steps to prosecute a student, "alleged to have been guilty of forging a certificate of having passed his preliminary examination at the Hall of the Society of Apothecaries, by which he obtained admission on the Students' Register." On the third day the communications from the various examining bodies of Scotland in regard to the establishment of a conjoint examining board were discussed in connexion with a letter from Sir Robert

Christison on the same subject, and also with two similar memorials transmitted by Professor Gairdner of Glasgow, and Professor Sanders of Edinburgh, both signed by several of the leading professors and practitioners of the respective cities. The discussion was somewhat stormy, and was for that day terminated by the adoption of a motion by Sir W. Gull, expressing "regret that no scheme had been framed and submitted to the Council by the medical authorities in Scotland for establishing a conjoint examining board." On the fourth day, however, Dr Parkes again brought up the subject by a motion, threatening that, unless the Scotch examining bodies had succeeded in forming a conjoint board for Scotland before 1st January 1873, the Council would endeavour to obtain a legislative enactment, under which a conjoint board may be constituted. This threat very naturally roused the hot northern blood, and Dr Parkes was told very plainly that Scotland would not be dragooned into taking action, and though open to reason and argument, would never yield to threats while its motto remained *Nemo me impune lacessit.* Ultimately a motion by Sir W. Gull was carried, "That a notice of the Resolution of March 2 (Sir W. Gull's former motion of regret) be sent to the medical authorities of Scotland, together with a statement that the Council still urges upon them the desirability of a conjoint scheme of examination, and expresses the hope that such a scheme as the Council can sanction may be submitted to the Council by 1st July 1872." The communications from the examining boards of Ireland were then considered, and a motion by Dr Humphry carried, "That the Council expresses its regret that no scheme has been framed and submitted to the Council by the medical authorities in Ireland for establishing a conjoint examination. The Council has considered the resolutions of the conference of representatives on this question, and hopes that a scheme for a conjoint examination, which the Council will be able to sanction, may be submitted to the Council by 1st July 1872."

Dr Acland then moved and carried the appointment of a committee "to consider and report whether the General Medical Council has power to make rules for the special education of women, such as may entitle them to obtain a qualification to be certified by the Council. And that the committee do further report for what purpose such qualifications, if any, should be granted; what are the most desirable means for educating, examining, and certifying in respect of them, with special reference to midwifery, the management of medical institutions, dispensing, and nursing." The fifth day was occupied partly by a discussion on this motion; partly by an ineffectual attempt to pass motions intended to hurry on the formation of the English conjoint board, so as if possible to bring it into action in January 1873; partly by an abortive attempt by Dr Acland to get a committee appointed for drawing up regulations common to all the conjoint boards "as to the time and mode of the commencement of the examination of the conjoint boards, and *the cessation of the examinations of the other examining boards;*" and partly by matters of minor moment,—the reception of the report of the Finance Committee, showing a balance in favour of income for the year 1871 of £878, 19s. 6½d., or upwards of £200 in excess of the favourable balance of 1870; and the carrying of a resolution that the executive committee obtain premises "where the meetings of the Council can be held, and the general business carried on with comfort and convenience." The customary formal votes were then passed, and the proceedings terminated.

The following is a copy of the memorial transmitted to the Council by Professors Gairdner and Sanders:—

"The undersigned having been informed of the recent proceedings on the part of the Universities and Corporations in Scotland, with a view to the formation of a conjoint board of examination at the instance of the Medical Council, feel bound to indicate their dissent from these proceedings on the following grounds:—

"1. The reason alleged for such proceedings in the first instance, viz., the attainment of 'uniformity of qualification,' *i.e.*, a fixed minimum of medical knowledge and skill on the part of candidates, secured through examinations conducted upon a precisely similar plan by examiners making precisely similar requirements, appears to the undersigned an object neither desirable nor attainable.

"2. Even were the object in question a desirable one, it evidently cannot be secured by the measures proposed. It is inconceivable that one board sitting in England, another in Scotland, and a third in Ireland, each board being of very complex constitution, and holding examinations in different places, without any concert or intercommunication, could possibly secure "uniformity" in any real sense of the word.

"3. The immense number of candidates which would have to be examined in each division of the kingdom by the conjoint boards, would make it absolutely necessary either greatly to enlarge the number of examiners and to subdivide them into companies (of course with a still further loss of 'uniformity' as regards results), or to work one set of examiners continuously day after day for long periods, with the practical effect of reducing their operations to a wearisome routine, incompatible with other professional pursuits on the part of the examiners, and entailing great hardship upon candidates by want of accommodation with the sessional arrangements of the principal medical schools.

"4. The expense of examinations so conducted would be, if thrown upon the candidates, a very serious addition to the cost of medical education and qualification, without any commensurate results as regards the security of the public.

"5. The undersigned are decidedly of opinion that if, for the public security, an additional examination requires to be introduced over and above the nineteen at present in operation, the cost of such additional examination should in any case not be thrown upon the candidates, nor yet on the existing examining bodies, but should be defrayed by the State, as representing the public.

"6. The true object to be aimed at, whether in view of the public interest or that of the medical profession, is (in the opinion of the undersigned) *not* uniformity, nor yet a fixed minimum of qualification, but the watching and stimulating the existing examining boards through a systematic inspection, conducted under the auspices either of Government or of the Medical Council.

"7. The undersigned profess themselves willing and anxious to facilitate to the utmost a thoroughly efficient system of examination in the Universities and Corporations with which they are severally connected, and would gladly welcome the visits of any inspectors appointed on the part of the public to secure, as far as may be, efficiency on the part of all such examining bodies in the performance of their important duties. In the case of the Universities, such a system of inspection would be quite in accordance with the system already introduced by the Universities Act for Non-Professorial Examiners. The undersigned are thoroughly satisfied with this system, and believe that an extension of it would do good.

"8. The details of such inspection should, in the opinion of the undersigned, be arranged between the State, as representing the public, and the Medical Council, as representing the medical profession.

"9. The undersigned desire it to be understood that, so far from objecting to a 'conjoint' system of examination, they would cordially welcome any voluntary joint action of different boards with the view of diminishing the labour and responsibility of examination, and the expense and trouble of it to the candidates. The objection that they entertain to the proposed system is, that it would not diminish either the expense or the trouble to the candidates, but would, on the contrary, increase both; while, by removing the responsibility of the practical part of the examination in some measure from the existing boards, it would tend very much to reduce all medical examinations to a low dead level, and would render it nearly impossible to improve them in accordance with the demands of advancing medical knowledge."

The letter from Sir Robert Christison to Dr Paget adopted in the main similar arguments against the possibility of ensuring uniformity of examination, and pointed out that the proper course of action for the General Council under present circumstances, was, "1. To persuade the several Royal Colleges to combine their examining boards in each division of the kingdom, so that no man should be licensed who had not undergone a complete examination, both in medicine proper and also in surgery; 2. To induce the Universities to receive from without an adequate number of examiners, not only to attain the same object, an examination '*in omnibus*,' but also to put an end to the outcry against candidates being examined only by their own teachers; and, 3. To establish a proper inspection of examinations, under the powers conferred by the Medical Act upon the Council." Similar views were recently advocated by Professor Gairdner in a lecture to the Glasgow University Medical Society, on "The present Critical Aspect of Medical Examination in relation to Medical Teaching," in the course of which Dr Gairdner made the following pertinent observations:—"What are the functions of examinations, and what are their objects and uses? In answering the question, put in the most general terms, he would be inclined to say that examination had a double function. It might be regarded in the first place as a system of police for dismissing, or rejecting, or eliminating incompetent men; and, in the second place, it might be regarded as a testing system for registering the results of education, so as to make itself felt by the learner and the teacher alike throughout the process of education. It was therefore obvious that the two functions were of the greatest importance, and also that an examination which was directed exclusively to one of these functions could not be so adjusted as always to fulfil the other to the best possible degree—or rather, by leaving out of sight one of these functions, the examination must be considered as to some extent defective in relation to its whole purpose. The second function was by far the most important, and every movement that tended to divorce the two objects and separate examination as a part of educational machinery from examination as a measure of police, was to be discouraged as tending inevitably, in course of time, to the serious detriment of sound education. He believed that the Medical Council of Education and Registration was at present engaged in a most dangerous experiment—one which had only very superficial benefits to recommend it, and many latent evils, not least of which would be found to be its arbitrary interference with all the Universities of Scotland, and with the teaching bodies all over the kingdom. What they wanted in the examination from a mere police view was to fix a standard above which men would be considered competent, and below which they would be considered incompetent. How were they to get at this? The examination must be conducted by a great number of different men, and it was utterly impossible in an examination by different men, or, as was proposed by the Medical Council, by conjoint boards for England, Scotland, and Ireland, to have a uniform line; and an examination which was founded on this idea of a uniform standard for the whole kingdom, must in the very nature of it be a fallacy, and must break down in practice. Good examiners were not berries that grew upon every bush, and it was a difficult matter to secure such men. Were the conjoint boards to employ teachers as examiners? or were they to set their face against such a plan? Were they to have the same examiners as at present? or were they to thin them out and have fewer, and give them more work? Now, if the examinations were put into the hands of the same men as had charge of them at present, was there any real prospect that the examination would be really different? and if they were not to be materially different, what was the use of all this new system of uniformity? At the very best, the advantage to be gained was exceedingly doubtful; and they were laying the axe as far as in them lay to the whole system, which, in the course of the last twenty-five years, had been operating towards the elevation of the standard of education; and which, during the last five, six, or seven years since the Medical Council was established, had been more extended and improved than it ever was before." Dr Gairdner then directed the attention of the students to a pamphlet written by Dr Lyon Playfair, and a paper in *Macmillan's Magazine* for March, written by Professor Tait, of the Edinburgh University. The lecturer then said that "he was very far from being opposed to the joining of examinations. On the contrary, if that conjunction of examination was not the result of an attempt to reduce them all to one model by pressure exercised by the State, he was in favour of it so far as it would secure to the public the benefits of the energies of the various seats of examinations being centred into one instead of over different bodies. If teachers were not the best examiners, no examining board at the present time could be efficient without them. He was far from saying that teachers ought to be the sole, or the chief, or even the majority of the members of an examining board; and he would be delighted if the University of Glasgow had more assistance from what were called non-professorial examiners than what they had at present. The only obstacle was the want of funds. Under the University Act, they had three non-professorial examiners, who were paid out of the Exchequer; and if the Exchequer would voluntarily pay more, he would be very happy to receive them, but he hardly expected such a boon from the present Chancellor of the Exchequer. Failing that, why should they not have an appointment by the Faculty of Physicians and Surgeons, by agreement with the University, of members of the general body of the profession, to go to the University and concur with the University Professors in examining students, and, upon that conjoint examination, to give licenses of the Faculty as well as the University degree? To such a system he would offer no obstacle, provided it was done as a matter of arrangement between the Faculty and the University, and not as a matter of compulsion, to put the whole examining boards of the country into one general and central board."

[The remark made by Dr Quain in the course of the discussion that "the English scheme did not aim at uniformity, but competence, and that it did not add a new examination to those already in existence, but reduced them to one," seems sufficiently to explain the object of the Council in urging the formation of what it calls conjoint examining boards, viz., the substitution of a *staats-examen* for the separate licenses now in force, which it depreciates in a most uncalled-for manner for the purpose of gaining its own ends. This examination must be carried out by the same men now employed on the separate boards, or by a portion of them, or by men much their inferiors in examining powers, because hitherto unacquainted either with examining or teaching, neither of which faculties are, as a rule, common in the ranks of general practitioners, from amongst whom the new examiners must be selected. This movement therefore cannot secure increase of competence in those licensed, nor therefore increased security to the public; it seems doubtful indeed, from the animus displayed, whether any such result was ever intended, or whether the object aimed at has not been the ruin of the Corporations and Universities, especially of the Scotch bodies, whose degrees have so long and so deservedly taken such a high rank, and been in such estimation both with the public and the profession as to attract candidates from every quarter of the kingdom, and to grind the profession beneath the heel of a centralized and imperial Cockneydom. The voice of the profession has made the Council, but it can also unmake it. *Delenda est Carthago* was in old times repeated till the end was attained; a similar result would no doubt nowadays be gained were we forced to reiterate *Delendum est Concilium Medicum.*]

SIR ROBERT CHRISTISON.—On the 23d of February, this distinguished physician attained his jubilee, having been a Professor of the University of Edinburgh for fifty years, being about the only Professor of that University who has served so long during the three centuries that it has existed. During that term, fourteen professors have served for forty years; Dr Hope, Professor of Chemistry, for forty-nine, and only one other—Professor Jamieson—for fifty years, but he only survived his jubilee a few days. The event was celebrated by the presentation of a sword of honour by the University Volunteer Rifle Corps, of which body Sir Robert has been Captain since its formation; by the presentation of a congratulatory address from the Edinburgh University Club of London—Dr Duckworth, Dr Davy, and Dr Hally being the members deputed to convey the congratulations of the Club; and by a banquet in the evening in the Douglas Hotel, presided over by the Right Honourable John Inglis, Lord Justice-General, and Chancellor of the University of Edinburgh. The banquet was attended by 250 of the most distinguished members of the profession from all parts of the kingdom, and was in every respect a great success.

SMALLPOX still prevails, though it seems decreasing; the deaths during February having been only 319 for the eight principal towns of Scotland, against 461 for January, and 354 for December. In Edinburgh the deaths from smallpox during February amounted to 144, or 25·4 per cent. of the deaths from all causes.

SIR JAMES PAGET, Bart., and Dr MATTHEWS DUNCAN, have been elected Hon. Members of the Royal Medical Society of Edinburgh.

List of Gentlemen who competed successfully for appointments as Assistant-Surgeons in Her Majesty's British Medical Service at the Examination at the London University on the 12th Feb. 1872.

Order of Merit.	Names.	Marks.
1.	Magill, J.	2239
2.	O'Donnell, R. W.	1956
3.	Donovan, W.	1885
4.	Swayne, C. H.	1795
5.	Tincler, B. M.	1785
6.	Browne, A. L.	1775
7.	Bushe, C. J. L.	1727
8.	Quill, R. H.	1725
9.	Slaughter, W. B.	1686
10.	Brown, D. B.	1675
11.	Keys, C. W. M.	1675
12.	Stokes, H. H.	1530

The Morisonian Lectures on Insanity for the current year were commenced on the 1st of March, and have been delivered in the Physicians' Hall on Tuesdays and Fridays, during the month, by Dr Arthur Mitchell, one of Her Majesty's Commissioners in Lunacy for Scotland. The first lecture was devoted to a consideration of the curability of insanity. In treating this subject, Dr Mitchell most efficiently employed his unusual facilities for tracing the insane from asylum to asylum, and the result ascertained, that in 12 years 36·6 per cent. have died insane, 31·7 per cent. are still alive insane, and 31·7 per cent. either alive or dead sane; while only 23 patients were for the first time discharged cured after more than three years of treatment, so that if recovery does not occur within the first few months after admission, the case must be regarded as in a great measure hopeless. The other lectures were mainly devoted to a consideration of subjects connected with idiocy, especially in relation to the influence of consanguineous marriages upon its production, which he did not lay much stress upon, as he believed that in Scotland at least 60 or 70 per cent. of such cases were not congenital, but the idiocy was acquired through some one or other of the numerous accidents to which children are liable.

The concluding lecture was delivered on the 19th ult., and consisted of a concise notice of the antiquities of lunacy in Scotland. The lecturer began by reading the Act of Robert I., which, he said, continued to be the only Scotch Act regulating the disposal of the persons of the insane till 1815. It provided that lunatics were either to be kept by their friends or to be put in prison; and its final clause enacted that "gif they (the lunatics) do any evil by negligent keeping, that sal be imputed to their keepers." But Sir George Mackenzie, commenting on the Act in 1699, was of opinion that it would scarcely be right to go the length of hanging a keeper for a murder done by a lunatic. He then gave some further illustrations of the treatment of the insane in olden times, and especially of its legalized inhumanity, and concluded by stating that by far the oldest of Scotch institutions for the insane, was the city Bedlam. After it came the wards attached to the Dumfries Infirmary, built in 1777. In reference to these, he stated that when it was found that twenty patients were received into them fourteen years after they were opened, the fact was regarded as indicating a startling increase of lunacy, and he asked what the people of those times would have thought, if they could have known that in 1870 there would be 265 pauper lunatics belonging to the southern counties in the Dumfries Asylum? After Dumfries came Montrose Asylum, which was opened in 1782, and which in 1821 had 55 patients in it. In 1870 it had 392. The Aberdeen Asylum was the fourth in age, being opened in 1800. The Royal Asylums of Edinburgh and Glasgow followed, being opened in 1813 and 1814. One hundred years ago, he said, all the institutions in Scotland would not have held 50. Even seventy years ago, they would probably not have held much more than twice that number; yet we have now more than 6000 patients in our Scotch asylums.

LETTERS TO THE EDITOR.

The Grammar School, St Kitts, British W. Indies,
10*th February* 1872.

Sir,—In the number of your periodical for September 1871 there appeared "Notes on Cases of Yellow Fever in St Kitts, W.I., during 1868, '69, '70. By W. Munro, M.D., C.M., Medical Officer, District No. 1." I now seek for redress in your columns, in the form of *strong reprobation* of what I conceive to be the unprecedented and unprofessional course pursued by Dr Munro in attaching the names of patients to the published notes of their cases. Concerning Case No. 23, which is that of myself, the only true statement is, that it "was a very severe" case; and if you will refer to the paragraph, I think you will see that, were I intending to insure my life, it would be calculated to do me definite injury.

The facts connected with my illness were, that the attack was so severe that I passed beyond ordinary stages of copious black vomit to one in which the black-vomit matter was voided downwards in a decomposed state. My recovery was due, under God, to the unremitting attention and skill of Dr Branch, who, being my intimate personal friend, remained for twenty-one days and nights in my house, attending besides only to his public work and to one other private case of yellow fever. Both by him and by Dr Dinzey, who most kindly helped to nurse me, I was conclusively and utterly given over. So far as remedial agents are concerned, my treatment may be considered to have been confined for the yellow-fever symptoms to sulphuric acid baths, and carbolic acid internally. Of the latter I took more than any one else, and I cannot trace the smallest evil results therefrom. Dr Munro never saw me during my illness or convalescence, and has but a slight acquaintanceship with me.

To give some general notion of what Dr Munro's notes are worth, I will add the following *exposé* of some few misstatements or misleading passages.

"Cases 14 and 15."—Speaking of Dr Branch, it is here said, "He saw the most of the cases up to this time." Quite untrue; and, seeing that out of the first fifteen attacked, nine died, the inference as to Dr Branch is mischievous.

Dr Munro states that there were "*not more than fifty Europeans and Americans*" in the island when the first case of yellow fever occurred. Last year's census gives the joint numbers as amounting to 172; and it will be understating to say, that there were at the time mentioned at least three times as many as assumed by Dr Munro. I can reckon of my own private knowledge a hundred persons of European or North American birth resident in the island at the time.

In the tabulated statement of all the cases which occurred, the black-vomit stage is mentioned in connexion with recovery only in the cases of two children; the obvious inference being that, in other instances of recovery, that stage was not reached—an inference widely at variance with the facts.

Were I at liberty to follow in Dr Munro's footsteps, and deal by name with other cases than my own, I could point out many more statements either incorrect in themselves or misleading as to inference; as I could also others—date of attack, for instance—affecting myself.

So soon as I obtained a copy of your Journal containing the said "Notes," I wrote to Dr Munro, acquainting him with my intention of seeking to have his unprofessional liberties as to people's names exposed in some of the leading medical periodicals. I received a reply intended to be highly sarcastic, while more or less apologetic in garb, but which is simply rude and impertinent; accompanying it was a certificate as to his (Dr Munro's) opinion on the eligibility of my life for insurance, totally inconsistent with his published paragraphs.

Trusting, either in the shape of publication of this letter as a whole or in part, or in any other form which may appear to you expedient, to obtain for myself, and other individuals whose names have been similarly treated without the slightest warrant or authority given to Dr Munro, some redress in your Journal, in whose pages the offence was committed.—I am, Sir, yours obediently,

HENRY W. MARSHAL, M.A. Cantab.,
Principal of the Grammar School, and
H.M. Inspector of Schools in the Island of St Christopher.

My two offices leave me but scant leisure for other matters; and it is only by this mail that I have found time to write the above.

BOROUGH LUNATIC ASYLUM, Newcastle-upon-Tyne,
6*th March* 1872.

SIR,—In Dr Lindsay's article on Colonial Lunacy Boards, the following sentence occurs:—"In the new asylum for the city of Newcastle-upon-Tyne, the physician's salary (I am told) begins at £250; but rises by £50 a year to £500, his additional allowances being board and lodging, including wine, and three servants." I am sorry to say that this is not the case; my income, etc., being arranged on a much more modest scale.—I am, Sir, your obedient servant,

R. H. B. WICKHAM, *Medical Superintendent.*

Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Dysmenorrhœa.* By J. MATTHEWS DUNCAN, M.D.

THIS term implies that a natural function is accompanied by unnatural pain. The idea of difficulty is often, and has long been, associated with this disease, but it is not essentially so. Pain is the distinctive indication of dysmenorrhœa. This helps to make the matter very simple, for if there is no pain there is no dysmenorrhœa: if there is pain in menstruation there is dysmenorrhœa. But if we look more narrowly into it, we find that pain is itself a very unsatisfactory criterion of a disease. We do not know what value to attach to the words used to express the feeling of pain. Nothing is more wanted by the practitioner than some good means of ascertaining the kind and degree of pain. In many, perhaps in the majority of cases of dysmenorrhœa, this want is acutely felt; but in many the pain is so severe that there can be no doubt of its high degree. In such cases it sometimes amounts to agony, and the constitutional effects of it are such as to render its greatness of degree apparent without the patient attempting to express the degree by too fallacious words.

The disease is subdivided into various kinds:—1. Neuralgic, or rheumatic, or gouty; 2. Congestive, or inflammatory, or membranous; 3. Spasmodic, or obstructive, or mechanical. This subdivision implies merely certain notions as to the nature or cause of the pain which constitutes dysmenorrhœa. It is a commonly adopted subdivision, and we shall make use of it. Farther subdivision—as into (1) Ovarian, (2) Uterine, (3) Nervous—merely increases the confusion, already great enough; for the inquirer will soon find that the common subdivision is the child and parent of as much ignorance and error as of knowledge and wisdom. In truth, it is at first sight manifest that the common subdivision is not really such, but an enumeration of at least three separate and distinct diseases, which have no claim to be classed together at all. So great is the confusion and ignorance of gynæcologists, that it would be paralleled by the surgeon who should class neuralgia, rheumatism, gout, simple inflammation, and painful mechanical disorders of the knee as one disease. The truth is, that dysmenorrhœa is merely a symptom, and the subdivisions of it indicate the names of what are imagined, and often too confidently believed, to be the primary diseases causing it.

1. *Neuralgic Dysmenorrhœa.*—When painful menstruation is not inflammatory nor spasmodic, it is generally called neuralgic. In like manner, when it is not inflammatory nor spasmodic, it is believed, sometimes on the flimsiest grounds, to be gouty or rheumatic. The further description of these varieties of dysmenorrhœa is, for the most part, mere garrulity. The pain occurs before, during, or after the menstrual flow. It varies in character and degree. It may be in the situation of the uterus or ovaries, in the base of the sacrum, or at the sides of the sacrum, or, indeed, anywhere.

The disease partakes of the character of other neuralgic disorders, and is treated accordingly. There is no speciality in the treatment that is worthy of mention.

2. *Inflammatory Dysmenorrhœa.*—When constitutional and local inflammatory symptoms accompany menstruation, then the pain is called inflammatory. The symptoms have no peculiarity, except their locality, in most cases. They generally commence before the menstrual flow, and often disappear slowly only after it is over. Indications of the inflammatory process—that is, pain and tenderness—are generally to be found in the uterus and ovaries, sometimes chiefly in one organ, sometimes chiefly in the others. The congestion or inflammation ends in resolution. If it ended in adhesions (perimetritis), or in parametritis, or in abscess whether perimetric or parametric, the disease would be placed in the category of inflammations, and removed from that of dysmenorrhœa.

On the second or third day of an uterine inflammatory dysmenorrhœa, a membrane is occasionally discharged along with the menstrual blood. When this occurs, the case is then called one of membranous dysmenorrhœa, and the disease is very apt to become chronic. This membrane gives a much desiderated definiteness to this class of cases. Not long ago it was regarded as like the membrane of croup, as a new inflammatory production. But, about a hundred years ago, it was known to be the same membrane as formed the decidua of pregnancy, namely, the inner layer of the internal or mucous membrane of the uterus. It is very rarely discharged, as the decidua of pregnancy is in cases of early abortion, or as we sometimes see it in cases of extrauterine gestation, that is, a complete mould of the cavity of the body of the uterus; and many cases of supposed membranous dysmenorrhœa are no doubt cases of early and repeated abortion, and this view is often confirmed by the large bulk of the mass that is discharged. In dysmenorrhœa the membrane is mostly discharged in patches or shreds, not in an entire triangular mould of the true uterine cavity. There is frequently no special pain accompanying the discharge, but generally it is followed or accompanied by an increase of the bleeding.

These pieces of membrane are easily identified by the naked eye, or by a simple magnifying glass. The smooth surface is remarked to have numerous openings, being the ends of the test-tube glands on the interior of the uterus. The external surface is rough and irregular, as may best be observed under water.

The separation and discharge of these pieces of membrane are effected by uterine contractions; and the separation may be facilitated or effected partly by the increased density of the membrane, partly by exudation of blood or serum between the cellular or crypt layer and the deeper glandular layer.

While membranous dysmenorrhœa is generally believed to be a cause of sterility, it is certainly not necessarily so. Pregnancy, when it does occur, is liable to be interrupted; and even if it fortunately continues till the full term, there is in this circumstance no guarantee for future freedom from the disease.

There is no treatment of inflammatory dysmenorrhœa that can be said to be very successful. The difficulty does not lie in the management of any single attack. That is conducted just as the treatment of any other local inflammation is carried on. But the disease is reproduced by the recurrence of ovulation and its attendant vascular congestion. In other words, it is impossible to secure rest of the diseased organ. Yet, under appropriate management, many cases improve greatly, and many at length recover. It is not necessary to enter here on the various appliances in a case of local inflammation—leeching on the uterine cervix, on the groins, or on the perineum; laxatives, especially salines; hot poulticing; mercury in small doses continued for some weeks, and without producing tenderness of gums, or other distinct signs of hydrargyrismus.

Latterly, applications, generally of a caustic nature, to the interior of the uterus have been proposed, and are tried. Their use demands much consideration and care, and as yet little can be said for them.

The rich are frequently gainers by resorting to what are called deobstruent mineral waters, mostly situated in Germany, during a few weeks in the fine weather of summer.

3. *Spasmodic Dysmenorrhœa.*—This is the chief form of the disease. When present in a high degree it is intense suffering. The pain is often so great as to produce writhing, sometimes sickness and vomiting, sometimes prostration with cold sweating. The pain is described by the sufferer as spasmodic; generally remitting, sometimes nearly completely intermitting. It may occur at any time during menstruation, or even while menstruation is absent. Generally it is severest in the early days of the discharge, and frequently most so on the second day, or before the menstrual blood flows freely.

The disease, as it comes before the physician, is generally chronic.

It may have begun insidiously, and gradually increased. When it has once begun it returns with great regularity at the periods, but its intensity at different periods is liable to great variations. It is common among the unmarried, specially affects the sterile, commencing after marriage, and much less frequently the fertile.

I have not been able to arrive at any satisfactory results as to the etiology of the disease. Only it is sure that sterile marriage is frequently in some way or other a cause of it.

This disease has been long regarded as being produced by mechanical obstruction to the passage of the menstrual fluid out of the cavity of the womb, and latterly, the prevalence of this view has greatly increased, and the term stricture has been applied to the obstructing cause. The pain is then described as being produced by uterine efforts to expel the retained menstrual fluid; but real bearing-down expulsive efforts are an uncommon occurrence in this disease. There are great difficulties in the way of realizing a satisfactory theory of spasmodic dysmenorrhœa. Yet this common mechanical theory is untenable in the present state of our knowledge. The disease which naturally occurs to the mind as the analogue of so-called mechanical dysmenorrhœa is stricture of the urethra. In both, there is believed to be partial closure of the natural passage for the discharge of an accumulated and accumulating fluid. In both, mechanical means of cure are recommended, and with one merely mechanical object in view—enlargement of the passage.

The more true analogy for spasmodic dysmenorrhœa appears to be after-pains. In both diseases there is pain, uterine and of a spasmodic kind, while a bloody fluid is exuding from the interior of the uterus and getting free discharge through the cervical uterine canal. Both diseases are generally most urgent during the first and second days, and then diminish, while the discharge continues to flow still for some days longer.

The following difficulties in the way of acceptance of the mechanical or stricture theory may be stated.

The stricture or mechanical obstruction is not demonstrated. The disease is a common one; yet, on examining the uterus, its canal is, with rare exceptions, found to be as patent as in healthy women, or as in women who have no dysmenorrhœa.

The cutting instruments and tents used in dividing or dilating the supposed obstructing part or stricture are so large as to be available only when there is no stricture. Their use is itself proof that the mechanical theory is erroneous, or that mechanical obstruction does not exist.

When, in rare exceptional cases, a stricture is found—generally a congenital stricture of the external os—dysmenorrhœa is not always observed to coexist with it. In other words, extreme stricture may exist without dysmenorrhœa.

When, in rare exceptional cases, a real narrowing is found, as in congenital stricture of the external os, accompanied by dysmenorrhœa, then cure of the stricture is not found to be reliable as a cure of the dysmenorrhœa.

When there is imperforate hymen or complete atresia of some part of the neck of the womb, and consequent dilatation of the uterine cavity by retained menstrual fluid—that is, when there is absolute obstruction to the discharge, not merely a stricture—then the pains complained of are not so severe in kind or degree as in a characteristic case of spasmodic dysmenorrhœa.

Not only is there not described any stricture or mechanical obstruction, such being only imagined; but the dilatation and hypertrophy of the uterine cavity, which should be the natural result of such mechanical obstruction, are not described, and not found.

Characteristic dysmenorrhœa is observed at menstrual periods which are scanty in flow. Indeed, many authors describe scantiness of flow as the ordinary condition of the disease.

It is often observed that when the menstrual flow becomes copious the pain ceases, or that when it is copious from the beginning, the pain is slight or absent—circumstances quite inconsistent with the stricture theory.

Violent dysmenorrhœa is often present (if we may be pardoned the apparent contradiction in terms) when there is no flow, and consequently when there can be no obstruction, as in cases of imperfectly developed uterus, or cases where the uterus is replaced by a fleshy tubercle.

The disease sometimes disappears unexpectedly, and, after some healthy periods, returns again; a circumstance quite inconsistent with the existence of a permanent contraction or stricture.

The stricture theory fails at every point; for even were there a considerable stricture, yet not an absolute closing of the canal, it is impossible to regard it as an obstruction to free discharge. A very small opening—that is, much smaller than that of the natural or ordinary uterine size—is sufficient to allow easy passage to a much greater quantity of blood than seeks discharge. It is not true that any described size of passage (including the quality of length) in cases of stricture will impede the passing of any ordinary menstrual flow. This may be, and indeed has been, demonstrated by experiment. It is to the destruction or removal of the stricture that treatment is directed by the believers in the mechanical or obstruction theory. The very frequently unsatisfactory results of that treatment do not justify much confidence in the evidence supposed to be afforded by it in favour of the theory. Indeed, except in the case of the external os uteri, it has not been shown that the result of the mechanical treatment is permanent enlargement of the passage or removal of the stricture; and it is not natural to expect that such a result should follow. Incisions, at least, in the length of a mucous canal will not enlarge it, but rather have the opposite tendency.

Supporters of the mechanical theory must meet the case against them as here stated, for the most frequently occurring conditions have been supposed. In addition, they have to show what appears to me to be intensely improbable, that the force of the movement of the blood as it is discharged from the mucous membrane is so great as to distend the cavity of the body of the dense unimpregnated uterus actively and quickly.

But the theory may perhaps be applicable in special circumstances, which I shall now consider.

The canal may be closed by a plug of blood or dense mucus. This, indeed, would better account for the symptoms supposed to arise from obstruction than the imaginary stricture. But there are great difficulties in accepting this theory. For, although clots are sometimes seen in dysmenorrhœal discharge, they are by no means a necessary or even an ordinary occurrence. Again, clots would in any uterus act as injuriously as in one that is the subject of stricture, and they are not rarely observed in menstruation without there being any dysmenorrhœa. Further, if clot-plugs were the obstruction, they would stop the discharge entirely till they were displaced—a stoppage which is not described in this disease. Besides, several of the arguments against the so-called stricture tell against this supposed form of obstruction.

In like manner, many of the above detailed arguments may be made to tell against the supposition that the partial or complete closure of the cervical canal by spasm may be the obstructing cause.

It has been said that the obstruction is at the external os uteri. But this notion is entirely without foundation of any kind. Curiously, and also ridiculously enough, this allegation is made by gynæcologists who recommend incisions for the removal of the imaginary obstruction to be extended as high as the internal os uteri.

This latter part is with some reason fixed upon as the site of obstruction. It is the narrowest point of the whole uterine passage, and it is much less dilatable than the external os uteri. Besides, other indications might be adduced. But, as I have already said, no sufficient stricture has been shown in dysmenorrhœal cases to exist here; indeed, none at all. Not only does no morbid stricture exist in these cases, but the history reveals no cause of such disease coming on. Sterile marriage, for example, is a frequent alleged cause; yet it would be a bold and unjustified assertion that sterile marriage is a cause of stricture. Surgeons have not, as yet at least, found it to be a cause of urethral stricture in the male.

The analogues of dysmenorrhœa of the kind under discussion appear to me to be after-pains, strangury, tenesmus. These two last affections do, indeed, sometimes exhibit their affinity with it by accompanying it.

Patients frequently distinguish between neuralgic and inflammatory dysmenorrhœal pains, and those of a spasmodic kind. Not rarely those of one kind disappear while those of another kind remain.

When the uterus of a sufferer from dysmenorrhœa is examined during the absence of the flow, there may be nothing amiss discovered. It is a great rarity to discover anything of the nature of a stricture, for this is a rare malformation; and I can only here express my surprise at the language used by physicians, in describing to patients the nature of their cases. Such expressions as "the womb closed," "the passage too narrow," and "stricture," are frequently and certainly inappropriately used. But frequently the following conditions are observed: An ordinary full-sized uterine probe passed into the uterus finds great and unusual sensitiveness or tenderness at the internal os of the cervix, and in the cavity of the body of the uterus; sometimes the sensitiveness is extreme, and the pain excited very violent. If the probe be allowed to remain, and the patient is asked what is the nature or character of the pain, she very frequently spontaneously describes it as the pain she has during her monthly period. A large probe, a No. 10 or 11 of the ordinary male bougie series, can frequently in the intensest cases of spasmodic dysmenorrhœa be easily introduced, if a little pressure is kept up for a minute or so, on the obstructing internal os uteri. Frequently, indeed, a much larger bougie can be passed than a 10 or 11. Sometimes, in so examining a case of this kind, temporary and partial spasmodic obstruction at the internal os can be made out. There is no difficulty or obstruction usually at the external os uteri. When a large bougie is passed through the cervical passage to the fundus, and allowed to remain, the spasmodic pain excited, at first very severe, gradually diminishes, and is almost, if not entirely, gone in less than a quarter of an hour. The dilatation of the internal os is then so far effected, and probably the irritated fibres have relaxed their spasms. The pain is again momentarily re-excited in withdrawing the bougie. The pain thus produced, is the pain of the spasmodic dysmenorrhœa, but generally severer, as might be expected. It appears probable, that the pain of dysmenorrhœa is produced by the flow of blood from a uterus whose irritability is increased by the performance of the function of ovulation, and by its concomitant phenomena.

When a tangle-tent is introduced through the internal os uteri, and allowed to remain, the history of the pain produced is generally as when a metallic bougie is introduced, only it lasts longer. When a metallic bougie is introduced, the dilatation is completed at once, for the time at least; but when a tangle-tent is introduced, this is not true, because, after the dilatation caused by its introduction, further dilatation is caused by the expansion of the tissue of the tent. Yet even with a tangle-tent, the spasmodic pain generally is at an end in some hours. Not always so, however, and this generally in characteristic or bad spasmodic cases. In them, twenty-four hours may elapse, and the patient be still writhing under the incomplete or still-proceeding dilatation. When, in these circumstances, an attempt is made to withdraw the tent, it is found difficult to effect the purpose; for while the parts of it above and below the internal os uteri are expanded, the part encircled by the internal os has not had as yet sufficient force or sufficient time to effect the dilatation of that part. The tent is thus firmly seized by the stricture. This stricture is found to be under half an inch from the point or inner end of the tent, and it is more abrupt at the lower than at the upper or inner side. If the tent is allowed to remain longer, it at last effects dilatation to its own full expanded size. It wears out the spasm, probably.

By using successively larger and larger bougies, and allowing due time for the relaxation of spasm produced by each successive increase in size of bougie, it is easy to dilate the whole uterine passage largely, that is, till an 18 or even a larger bougie is passed.

In studying the theory of spasmodic dysmenorrhœa, it is worth while to remember the small size of the uterine extremities of the Fallopian tubes, and the possibility of spasm in these tubes, and of difficulty in the progress of the ovulum or other discharges from the tube into the uterus.

The diagnosis of dysmenorrhœa is easily made. It is painful menstruation, and it has only to be ascertained that the patient is probably or really menstruating. To diagnose simple dysmenorrhœa, it is necessary to ascertain the absence of any complicating uterine disease which may induce the pain directly or indirectly, as a uterine fibroid.

To diagnose the kind of dysmenorrhœa is generally easy, so far as such diagnosis goes. The different kinds may be conjoined; a dysmenorrhœa may be at once neuralgic, inflammatory, or congestive and spasmodic. To describe the diagnosis would be merely to repeat what has already been said under the head of symptoms.

The treatment of spasmodic dysmenorrhœa is highly unsatisfactory.

In slight cases, relief is gained by the popular remedies directed to increase the discharge. These are the hot pediluvium, and the swallowing of alcoholic stimulants, or of sal volatile. In somewhat severer cases, benefit is got by the use of antispasmodics, and the weaker sedatives. Among such remedies, the chief are ether, hyoscyamus, Indian hemp. Diaphoretics are also useful.

In the severer cases, all such remedies are of no avail. Relief can be secured by anæsthetic inhalations, or by the use of opium in some form. Many authors recommend the use of special preparations of these kinds of medicines, and often special methods of using opium, as by the mouth, by enema, by hypodermic injection; but after many trials of all methods, I have failed to discover any decided advantage in one method or another.

It is obvious that this kind of treatment is not in any sense curing. It is a poor compromise which really consists in the drowning of a pain, or a painful disease, by another artificially-produced disease, which is probably more injurious to the constitution generally. Intoxication for a day or thereabouts by chloroform or by opium every month, is a morbid condition which has many disadvantages and dangers of its own. Yet there are cases in which the pain of dysmenorrhœa is so severe, that the practitioner is glad to resort to these drugs.

Dysmenorrhœa is often associated with sterility. Both are conditions which induce women to insist upon treatment, and to make them regardless of risk. But it requires to be kept in mind by the practitioner, that he is not justified in using a remedy whose proper risk is out of due proportion to that of the disease which he is treating. A so-called radical cure has long been in use for this disease. It is dilatation of the cervix uteri, and its introduction was a matter of course, when the mechanical or stricture theory of the disease was conceived. But the value and application of the treatment by dilatation have no essential dependence whatever on the truth of the theory which led to its adoption.

It is proposed to effect dilatation of the cervical passage in various ways; by scissors, by metrotome, by sponge or laminaria tents, or by metallic pessaries allowed to remain for some length of time, by bougies allowed to remain only a short time, and by dilators whose use takes only a short time.

The scissors is used to open up the external os of the cervix by those who believe this part to be the seat of obstruction. An ordinary scissors will answer the purpose, but special scissors have been constructed for the operation. It is easy to snip through the vaginal portion of the cervix at each side, and thus make a free opening into the cervical cavity. The wounds heal without restoring the small size of the original os—a result which can be easily understood on considering the arrangement of the parts. The operation may be compared to what may be called making an artificial hare-lip. Were the external os the seat of obstruction, this would be the proper operation for curing dysmenorrhœa. But I believe it is quite useless, except in the rare cases of abnormally small external os; and in them it cannot be trusted to as a cure of dysmenorrhœa should that disease complicate the malformation. If the external os is the seat of the disease, it is, of course, at least foolish to interfere with deeper parts. The plan of dilating the external os by incisions commencing at the internal os is ridiculous, both in a theoretical and practical point of view.

The great and rational attempts at a so-called radical cure, are directed to produce dilatation of the internal os of the cervix. If any particular point can be called the seat of the disease, this is the part. Many means have been, as already said, proposed and used with this object in view; but it is very doubtful whether or not any of them effects the purpose otherwise than temporarily. Cutting instruments appear at present to be the favourite tools, and it appears to me highly improbable that the result can be ultimately other than induration of the canal or passage by the resulting cicatrices. Experience, however, is the best test of their value, and may prove it;

even although the theory of mechanical obstruction may at the same time be shown to be false.

The instruments for bloodless dilatation of the internal os of the cervix may be divided into two classes:—1. Those allowed to remain for at least a day. 2. Those not allowed to remain above a few minutes.

The former class includes sponge-tents, laminaria-tents, metallic pessaries. The dilatation by tents is effected in the course of one or two days. The same is true of the metallic pessaries, but it is usual to allow these to remain for a long time,—that is, months or years,—if they do not excite acute inflammation.

Various metrotomes have been invented to incise the internal os uteri, and the operation is easily performed. Hæmorrhage is not unlikely to occur, especially if the incisions, which are made laterally, are made too deep. This hæmorrhage is arrested by a perchloride of iron plug in the cervix. Various injurious and useless plans are recommended to prevent, as it is said, the wound from closing, or from closing improperly.

I have used all these means of dilatation, and have been most extensively a witness, directly and indirectly, of their employment by others. The sanguine proposers of these methods have produced no satisfactory data to support their practical recommendations, and I regret to say that I have none prepared to support my own opinions. The absence of data is to a great extent justified by the impossibility of making good evidence out of them. Indeed, in the absence of any kind of odynometry, we must be content with a distant approach to good evidence. Some physicians appear to cure their cases as well and quickly without dilatation as others do with it. Yet, in the hands of every gynæcologist, there are many inveterate cases of severe dysmenorrhœa, and it is upon these alone that any dilatation should be even proposed to be tried.

My knowledge of the results of the use of the means hitherto spoken of may be summed up in a few sentences. Not unfrequently they produce a complete cure for one period; and this is no gain, because the pain (not to speak of the danger) of the operation is a set-off against it. Rarely their beneficial effect is more lasting, the cure being partial or complete. Not very rarely they have caused death either by hæmorrhage or by inflammation. Very frequently they have caused cervical catarrh, endometritis, parametritis, perimetritis, ovaritis, with all their attendant ills. Frequently they have aggravated the dysmenorrhœa. In short, their use has been most unsatisfactory. So much has this been the case, that, in common with those friends on whose experience and judgment I have most reliance, I have been reluctantly forced in the meantime to discontinue the use of a most promising remedy for a most painful disease.

But the occasional apparent complete success of the plan has led me to try again the method of effecting the purpose with the least risk of doing injury, the second class of instruments for bloodless dilatation being used. This least injurious method is the oldest of all, and it has been nearly forgotten in the crowd of its modern rivals. Even of it I would not wish to be thought to speak definitively. It involves the infliction of no wound; the instrument used remains in the womb only for a few minutes at a time, and sufficient time is left between the repetitions of its use to allow the disappearance of the irritation it causes. This method certainly causes much pain; but if it do not cure, it appears to me to cause, in the very great majority of cases, no injurious inflammation.

The operation is performed between two monthly periods, and it consists in introducing as large a bougie as will easily pass (a 10 or 11 in the ordinary male urethral series). On each successive day a larger bougie is introduced, till after several introductions, say seven, a large bougie is passed (an 18 or 19 in the ordinary male urethral series). The bougie to be passed does not enter the cavity of the body of the uterus at once, but moderate pressure continued for about a minute secures its passage. The dysmenorrhœa-like pain produced is severe, and lasts for about fifteen or twenty minutes, and then the bougie is withdrawn.

All the varieties of treatment, medicinal and other, applied in other forms of the disease are also tried in this form, and success is said occasionally to follow their use.

ARTICLE II.—*A Case of Obstruction of the Bowels, attended by unusual Symptoms; with Remarks.* By JOSEPH BELL, F.R.C.S.; and J. HALLIDAY CROOM, M.B.

(*Read before the Medico-Chirurgical Society of Edinburgh, 6th March.*)

J. H., a bank messenger, sent for me on the morning of Sunday 4th February, at 4 A.M. He is a spare, emaciated man, about fifty years old, somewhat under medium height. Previous to his present illness, he has enjoyed perfect health for thirty years, never during that period having occasion to consult a doctor or lie in bed a single day from illness.

4th Feb., Sunday, 4 A.M.—He tells me that he was perfectly well yesterday, and went to bed in his usual health last night. I find him now presenting the following symptoms:—He is sitting in bed, his elbow on his knees, groaning; his face bathed in a profuse perspiration; his tongue furred; pulse 120, hard, regular, and sharp; breathing short and oppressed; complains of thirst and much pain in left lumbar and iliac regions. This pain increased on pressure. The percussion note over this area is somewhat tympanitic. The lungs, heart, and other organs are healthy. His bowels were relieved yesterday. The motion was scanty, thin, and watery. Ordered to have opiate fomentations over abdomen, and ℥j. of castor-oil, guarded by ♏xxx. of laudanum.

4th Feb., Sunday forenoon.—The castor-oil has had no effect. Pain in abdomen, localized as before, and increased in severity on pressure; thirst continues; pulse 115, hard, incompressible. Ordered Battley's sedative solution to be applied by spongiopiline over abdomen. To have an enema of castor and soap-sud. Ice to suck; milk and beef-tea.

Sunday, vespere.—Injections failed to have any effect. Pain continues, and tenderness extending across abdomen. There is distinct tympanitis in left iliac and lumbar regions. Complains of a feeling of tenesmus, but nothing has passed; no vomiting. Pulse 115; temp. in axilla, 99·5°. Passed a large quantity of urine, which, when examined, was found to be normal. Twenty minims of solution of bimeconate of morphia (9 grs. to ℥i.) was introduced by hypodermic syringe over seat of pain. To repeat enema in morning. Diet, milk and potass-water alone.

5th Feb., Monday, 9.30 A.M.—Patient has had snatches of refreshing sleep during night; enema had no effect; pain over abdomen diminished; no vomiting; expression anxious. His eyes have a staring look. His complexion seems of a duskier hue. Complains of violent borborygmi, and occasional hiccup; pulse 110, weaker; temp. in axilla, 98°. Ordered ♏ii. of croton, and afterwards a ¼-gr. morphia pill; poppy-head poultices over abdomen. To have small quantities of brandy and white of egg.

Monday, vespere.—Bowels unrelieved; pulse 120, weak, incompressible; no vomiting; temp. 98°; features more pinched; pain localized in abdomen, but less intense. There is tympanitis along track of colon. Ordered gr.viii. of calomel.

6th Feb., Tuesday, 11 A.M.—Professor Simpson saw patient in consultation to-day, and, after careful examination, advised a hand-basinful of soapy water to be introduced into gut by means of O'Beirn's tube. Patient *in statu quo;* pulse 115, decreasing perceptibly in strength; tympanitis in left iliac fossa increased; less pain on pressure.

Vespere.—No change in condition after enema; patient experienced relief, and passed some flatus; no vomiting; hiccup recurs to a slight degree at intervals; distension of abdomen more marked, however, in right and left iliac and lumbar regions. Ordered to have ¼ gr. of morphia every hour, until patient is opiatized. To continue brandy and white of egg.

7th Feb., Wednesday, 9.30 A.M.—Patient is fully under influence of opium; pupils contracted; is drowsy, and when spoken to answers distinctly, and then relapses into a dose; complains of no pain; no vomiting; pulse 120, stronger and fuller. There has been no action of bowels. To stop opium.

Vespere.—Passed a little flatus; pulse 130, weaker than in morning; pain and distension over abdomen increased; no vomiting.

8th Feb., Thursday.—This morning patient complains of a feeling of great tightness and constriction over abdomen; pulse 115, weak; no amelioration of symptoms; features much more pinched; patient gradually becoming weaker. As the patient had got no relief from the usual medical remedies, and was gradually getting weaker, believing that surgical interference alone gave the patient a chance of recovery, I asked Dr Bell to see patient with me to-day, which he kindly did.

There are one or two points of medical interest in this case, to which it might be worth while to draw the attention of the Society.

In regard of the causation of the disease, one fact is very remarkable, viz., the entire absence of any assignable cause.

After a most careful inquiry, I could discover no history of any predisposing or exciting cause. He was a man of unusually temperate and regular habits. He had not previously been subject to any inflammatory attack, either of chest or abdomen. He had been undergoing no unusual fatigue, or exposed to any sudden heats or chills; on the contrary, he had been pursuing the simple and light duties of an office messenger. He went home on Saturday afternoon, and retired to rest in the evening in his usual health. The first accession of the disease was between 1 and 2 A.M., when he was roused by an acute pain in his left side, which he believed to be colic, and which, when I saw him two hours later, I attributed to the same cause.

One point is, however, worthy of remark. There is no one symptom which is described as more uniformly accompanying continued obstruction of the bowels, than constant intractable vomiting, at first simple, consisting of the contents of the stomach and mucus, but which, in a few days, becomes stercoraceous. In this case, although the symptoms of intestinal occlusion were well pronounced from the first, still, at no period during the progress of case, which lasted nine days, was there any vomiting nor any tendency to it. Nausea even was not present to any extent. Patient partook freely of milk, beef and chicken tea, and on two occasions, unknown to me, ate solid food in the shape of chicken and ham, so that the absence of vomiting could not be accounted for on the plea that the stomach and bowels were empty. Moreover, the post-mortem showed the stomach and bowels moderately full. This may be accounted for to some extent by the fact that, during his whole illness, the patient secreted urine very freely, and thus to a great extent diminished the fluid contents of the bowels; and as the occlusion was comparatively low down in the small intestine, no fluid accumulation had time to take place.

With reference to the medical treatment of the case, I have but one remark to make, viz., that the castor-oil and calomel, which were administered respectively on the third and fourth days of the illness, did harm, from the fact that they were given too late, and on each occasion increased the action of the bowels, and thus, instead of allaying, intensified the inflammation. J. H. C.

I now take up the history of this case where Dr Croom stops. On Thursday evening, he kindly asked me to see J. H. I found him calm, patient, and exceedingly self-possessed, sitting up in a semi-erect posture in bed, and complaining of little except a bad pain in the belly. The abdomen was swollen, very red from the poultices and turpentine; on the whole, resonant on percussion, especially above the level of the umbilicus. There was no hernia, nor history of any previous hernia. The bladder was empty. There was no marked tenderness anywhere, but the pain was localized chiefly in the right iliac fossa, rather above the position of the ileo-cæcal valve, and at this spot careful deep-seated pressure gave the sensation to the hand of several coils of intestine matted together and distended chiefly with air. That is, I felt a tumour which was immovable out of its place, as if moored to the back of the abdomen; it was lobulated and resonant. The patient was naturally a spare man, so it was possible, notwithstanding the general flatulent distension, to have a fair idea as to the position of the contents of the lower abdomen. There was no trace of fluid in the cavity so far as palpation could tell. There was a certain amount of pain, and dragging, twisting sensation in the left iliac fossa. There was *no nausea*, *retching*, *vomiting*, nor *even hiccup*. The patient was not at all narcotized, but his pupils were fairly contracted. The pulse was 108, of fair strength, and regular.

After conversation with Dr Croom, I ventured the diagnosis of a twist of the small intestine, probably quite close to the cæcum, that it was not like intussusception, but that the case was a very bad one, and that we must keep in view the operation of gastrotomy, if symptoms did not abate. In the meantime, to carry on the opiate treatment, to continue the small quantities of beaf-tea, ice, etc.

Dr Croom was gently to open the question of operation to patient and relatives.

Next day we met again. I brought my assistant, Mr Milne, and my instruments, for the operation. The case was in nearly every respect unchanged. No vomiting had occurred, though he still took his food as directed. No stool had passed, but an explosion of flatus had greatly cheered and relieved both body and mind. Any idea of an operation was refused by the friends; but no real progress had been made; on the contrary, the flatulent distension and local tenderness in the right iliac fossa had greatly increased, and he was feeling much more pain there. So, knowing how very harmful mere distension was in destroying any hopes of the twisted bowel righting itself, I got leave to tap the distended portion with a fine exploring needle. I had not an exhausting syringe sufficiently small to fit it, so inserted the needle without the syringe, and had the satisfaction of draining off, first a very considerable quantity of flatus, which escaped with a hissing sound, and then allowed about two ounces of serum, with a distinctly fetid odour, to escape. The patient expressed himself much relieved, and the local distension was very visibly diminished.

We again met early on Saturday. Still no vomiting nor even retching; indeed, not a symptom of any obstruction except the obstinate constipation, notwithstanding we had stopped the opium. The small trocar-wound was scarcely visible, and the pain in the right iliac fossa was much less. No more flatus nor fæces had passed. Urine continued normal.

Patient and relatives were still very unwilling for any interference to be attempted; and, indeed, in the face of the complete absence of stomach symptoms, we could not urge it. But the patient was willing, indeed anxious, that we should again relieve him of some of his distending gas. So, as there was a very distinctly limited resonance in the left iliac region, I again tapped him, drawing off, first a quantity of fetid gas, and then about two ounces of colourless and odourless serum, which, on standing, coagulated into a jelly. This we regarded as indicative of the presence of peritonitis.

We again met in the evening, and found the patient easier, fancying himself much better. Not a trace of nausea or vomiting; he still was taking beef-tea with relish. His pulse was 90. The pain was trifling. His intellect was perfectly clear, so much so that he reasoned with us as to the possible variations in the normal temperature of the body, and as to the effects of foods of various kinds upon the temperature. Still not the slightest passage of flatus or fæces; and there was one symptom which we did not like, and which had introduced the subject of temperature—his feet and hands were distinctly colder than natural, or than they had been previously. We ordered warm bottles and small quantities of brandy.

Next morning I was informed that he had died during the night, without the supervention of any new symptom, and without the *occurrence of vomiting or even retching* from the beginning of the case to the end.

Sunday, 9.30 P.M.—Although the patient had not been dead above eighteen hours, decomposition had gone on rapidly, and the odour of the room was horribly putrescent. The abdomen was discoloured and tympanitic all over, immensely swollen. The marks of the trocar were quite healed and hardly visible, like the central stain of a flea-bite.

On opening the abdomen, the peritoneal cavity was full of serum, with curdy flakes of peritonitis in it, and mixed with a quantity of little-altered beef-tea. General peritonitis of both parietal and visceral peritoneum. In the right iliac fossa, there were several coils of small intestine matted together, and adhering by means of masses of recent soft flocculent lymph; the bulk of the coils showed a chocolate-brown, almost black colour. They had lost their lustre, polish, and tension, and a portion of a coil had burst, leaving a hole with ragged edges, nearly as large as a sixpence. For three inches from iliac valve, the intestine was absolutely contracted and empty, up to a distinct twist, rather more than a half turn, which evidently was the seat of obstruction. The colour was tolerably healthy, except that it was congested for a few inches from the cæcum, which was almost empty. The ileum contained some small fæcal masses, but no gall-stone nor any specially hard body. The other abdominal organs were normal. We were not permitted to examine head or thorax.

Several questions, of very great practical interest, seem to me to be connected with this case. I will endeavour not to be tedious about them. They involve both diagnosis and treatment.

Diagnosis.—1. I cannot find, in any of the writers I have consulted on this subject, a single hint at the possibility of a case of obstruction, such as this is, ever going on to a fatal termination, without the occurrence of some symptoms of nausea and vomiting.

Authorities differ as to the exact cause of the vomiting, which is always urgent, generally stercoraceous; some ascribing it to a reversed peristaltic action, others, as Brinton, to the occurrence of a central backward current in the distended bowel, the peripheral current of which is still sent on in the natural direction; but all authorities regard the vomiting as the cardinal symptom. I need not multiply quotations, as all are at one on this point.

2. How did we arrive at the diagnosis of twist or kink in the small intestine, immediately above the colon, which we made at our first visit, and stuck to all through? Chiefly by exclusion. The pain was not sharp enough for gall-stone, nor in the right place. It was too rapid in its progress for malignant stricture. The patient was not of an age at which we might expect adhesion of vermiform appendix, or diverticula of ileum or ruptured mesentery.[1] These, as Brinton's careful tables show, are almost always diseases of youth or early manhood; while the average age at which twists or rotations of mesentery on its own axis take place, is fifty-four.

Again, as to its exact seat. We knew that the large enemata and the long tube had passed well into the colon, so that it probably was right; *second*, that there being no vomiting, made the ileum more probable than the jejunum. And, *lastly*, the tumour, so firmly moored in the right iliac fossa, seemed probably ileum low down; had it been even a foot or two up, it would likely have changed its position at times.

The small intestine, however, is very rarely the seat of twist, compared with the large, 76 per cent. occurring in the large, only 24 per cent. in it. This difference is still more remarkable, when we think of the difference in length of the small and large intestines.

The peculiar coiling lobular movement of the affected portions are so well described by Brinton, that I will use his words, in preference to my own, to describe what we saw and felt. After bor-

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[1] Brinton on Intestinal Obstruction, p. 88.

borygmi, which often herald an obstruction, "soon succeed less noisy, but more violent, movements of the intestine, during which it rises visibly against the walls of the belly in coils, that might be fancifully compared to those of a writhing serpent. As the distension of the canal increases, these movements become more marked, and are often so distinctly seen, through the stretched and attenuated wall of the belly, as to allow the observation of a definite peristalsis in the intestine beneath it; and even when, at a later period of the disease, the paralyzed intestine has ceased to offer any of these active movements, the aid they furnish to diagnosis is often replaced by the exactness with which the distended bowel is mapped out on the abdominal parietes; the swellings, answering to the tube itself, being thrown into relief by hollows, which correspond to the intervals of adjacent loops of bowel" (Brinton, p. 25).

Pathology.—We have next the very difficult question to settle as to what is the initial mischief in this case and similar ones. (1.) Is it a peritonitis which first glues the bowels together, and thus predisposes to the occurrence of a semi-rotation of the further bowel on its own axis, and consequently a kink or twist? or is it (2.) The twist forming accidentally first, and then the peritonitis occurring as a secondary condition, the result of the stoppage?

The latter seems by far the most likely explanation, and is supported by the best opinions.

Sir Thomas Watson says the inflammation is an accident or consequence of the obstruction, or of the means used to overcome it (Prac. of Physic, ii. 463).

Brinton hints at a connexion between enteritis, and an irregular and defective peristalsis, as explaining these twists (op. cit., p. 87).

Pollock finds an explanation in a predisposing anatomical and an exciting physiological series of causes. Thus, "Rokitansky has very justly observed, that the predisposition towards incarceration, from twisting of the gut, is dependent on a congenital or acquired long, loose, flabby mesentery or mesocolon. But the mere existence of such a state, which allows very free movements of the bowel to take place, is hardly sufficient to account for sudden strangulation of the parts taking place. It appears to us, that something is requisite to establish the twist; and that this something is to be found in an accumulation of feculent matter, invariably present wherever such twists occur. This accumulation of fæces, fluid or solid, so loads and distends the bowel, that if accidentally it becomes shifted into a position unfavourable for the free passage of its contents, the intestine has no power to recover itself, nor has its peristaltic action any influence in altering its position, or that of the contained fæces."

The presence of a gall-stone or a tumour may in some cases explain satisfactorily enough a twist; no such reason was present here, nor was there any very distinct history of exaggerated constipation.

The ileum above the twist did contain a few scybala, as also the colon, but they were few and small.

Treatment.—The treatment of such cases may resolve itself into two heads, medical and surgical.

I. *Medical.*—Every case of this kind will, at the outset, be undistinguishable from a common case of colic combined with constipation, and as such, will be treated either by doctor or relatives. The question soon comes up, How long are we to persevere in the purgative treatment? I answer in Sir Thomas Watson's words, "Common sense and common humanity answer, you must stop it the instant you are convinced there is a mechanical obstacle which cannot be overcome" (op. cit., p. 464). After this, what?

1. Opium pushed boldly, to soothe and quiet. Belladonna is highly recommended by Brinton, in cases where opium does not act. 2. A diet containing as little waste matter as possible, beef-tea, ice, etc., in small quantities. 3. Nutritive enemata.

II. *Surgical.*—Enemata repeated again and again, as large and as warm as possible, always expecting that, by patience, hardened fæces may be broken down; but, *N.B.*—Do not use enemata if the first is not returned, as in some cases the enema passes the twist, and remains behind it, only doing much harm by adding to the distension.

2. Tapping the intestines above the seat of stricture, to relieve distension by fæces or fluid. All writers on this subject are agreed, that nothing is so likely to induce or maintain an internal twist or strangulation as undue distension of the intestine. It rapidly produces paralysis of the muscular coats, diminishes or entirely stops all peristalsis, and is a most fertile cause of absolute stagnation.

In Brinton's words, "Whatever diminishes or protracts this inevitable process of distension, and thus restricts it to those moderate limits, within which alone its results are salutary; whatever prevents the access of paralysis in the muscular wall of the bowel, or helps that wall, already more or less exhausted, to recover some of its pristine vigour; whatever does this, will not only stave off death in fatal cases, but will assuredly, in any large number of obstructions, often mediate a complete recovery. . . . And this distension, which sensibly destroys the tissues of the distended bowel, by a violence of the inflammatory process, traceable through all grades, from extreme congestion to downright gangrene; which not only prevents, but mechanically disturbs that sequence (in time and place) of adhesive organization, and ulceration or sloughing, necessary to remove and oppose the disease and healthy sequents respectively; and which further arrests the peristalsis requisite to get rid of the putrid sloughy exuvium, set free in the cavity of the intestine,—distension is, from all these reasons, still the *bête noir* of the story" (Brinton, op. cit. pp. 105, 106).

Gay remarks, "Usually the tightness of the twist is in proportion to the distension of the bowel." I could quote many more authorities on this subject.

Can we relieve this distension easily, painlessly, and safely? I believe we can, in the simplest manner, by tapping the bowel with a fine exploring needle.

I need hardly remind the Society of an operation on a similar principle, often performed on animals, but I hope to show, that even to man, this is neither difficult nor dangerous.

Professor Gross, of Philadelphia, has long been of opinion that great, if not permanent relief, might be afforded in cases of gaseous distension by puncture, as its escape might not only enable the tube to regain its contractility, but also take off pressure from diaphragm and abdominal muscles. He has done it himself in one case, in which great relief to distension and suffering, in scirrhus of the colon, resulted, and the patient survived the puncture for three weeks.

I have collected a considerable number of similar cases in the French practice of the last few months, and already put them on record in the pages of the *Edinburgh Medical Journal*, in the Nos. for December 1871, January and March 1872; and a most interesting paper by Mr Wathen, of Fishguard, in the *British Medical Journal* for 21st October 1871, has brought to light a large number of similar experiences in English surgery, which I briefly summarize:—

(1.) Mr Wathen's own: tympanitis, six punctures, death, no post-mortem.

(2.) Mr Teale: death, no trace of puncture.

(3.) Mr Salmon: no bad effect on post-mortem.

(4.) Mr Thomas: great relief.

(5.) Sir H. Marsh: great relief, recovery.

(6.) Lawson Tait: numerous punctures for days together.

(7.) Dr Symes Saunders quotes a large number of authorities in support of the practice, ancient and modern, and among them Dr Ollivier, who operated on twenty cases in Bolivia, with eight recoveries and twelve deaths.

3. Could this have been remedied by operation? and if so, by what operation?

I think it could. Had we obtained leave to operate sufficiently early, the loop of intestine might have been unravelled, and the twist reduced. Still, in the very remarkable circumstance of there being no vomiting, I do not think we had sufficient warrant to force or insist on an operation.

What operation should be performed? *Not colotomy;* for this, though most useful in some cases of stricture of the sigmoid or rectum, would not have been of the slightest use in this case, as the colon was empty, and the stricture above it; and also, experience has shown, that even when the obstruction is in the colon, colotomy does not suffice. The distended small intestine has been cut on, and an artificial anus made after Nelaton's method. This operation may possibly give temporary relief, but it is impossible to tell which portion of the intestine may be brought to the surface and stitched to the wound. So the artificial anus, in all cases a disgusting and dangerous deformity, may quite likely prove useless, from its being so high up that the patient may perish from inanition.

Gastrotomy, or laying open the abdomen in the middle line, seems in cases like the present the only, though a very doubtful and dangerous, remedy. I need not here insist on the details of such an operation, but the successes of ovariotomists have familiarized us with incisions into the peritoneum, and give hopes of a good result in the future.

In all such cases the diagnosis is difficult, and the operation so dangerous, and the possibility of a cure by nature's efforts so apt to encourage a too-long delay, that probably cases cured by operation will be few and far between. To enable us to form a correct opinion, cases should be carefully watched, and, if possible, always examined and recorded. Hence an excuse for a long, and I fear, so far as my part is concerned, a tedious paper. J. B.

ARTICLE III.—*The Nature of Rötheln or German Measles*: Being part of an Inaugural Thesis commended by the Medical Faculty, Edinburgh University, 1871. By ROBERT W. FOSS, M.D.

THE following is a typical case:—R., brassfounder, æt. 27 years, a dark-complexioned and very muscular man, temperate in his habits, says he never had a day's illness in his life. About a month since, several children living in the house where he lodges had scarlet fever.

On 15th December 1870, he felt much malaise, insomuch that he was unable to go to his work. He also complained of his throat being slightly sore.

19*th December*.—Says that he felt "worse" yesterday; that he had frequent rigors; his skin was hot and burning. There was great thirst, and a constant feeling of heaviness in his head. No rash; sore throat still the same; slept badly at night. He was first seen by me to-day, and was then prostrate in bed. His skin was hot, and perspiring much. The temperature (according to one of the ordinary self-registering thermometers, placed in the axilla and allowed to remain seven minutes) was 102·2°. There was a scarlet, punctated, non-papulated, non-crescentic-shaped rash, diffused over the whole of the anterior surface of the chest and upper half of the abdomen, the loins, and at the flexures of the elbow and knee joints, the remaining portions of the cutaneous surface being clear. He says that he first saw this rash to-day, although he had closely examined his skin every day since the beginning of his illness. He complains of his throat being very sore. None of the glands about the angles of the lower jaw are enlarged perceptibly to the touch externally. The whole of the back of the pharynx, soft palate and its pillars with the tonsils, are red and congested. The tongue is dry, and presents a white, furred base and centre, the margins being red; the papillæ are slightly more distinct than normal. There is complete anorexia. The bowels are regular; says he did not sleep last night at all. He complains of violent, "heavy," frontal headache. The pulse is 120, full, and hard. The face is congested, and has a dull expression. He has a constant discharge of watery fluid from his eyes (epiphora). There is also photophobia. The conjunctival vessels, especially of the eyelids, are enlarged. There is also a slight watery discharge from his nostrils (coryza), but he says it is of no consequence compared with the other. He has occasional cough, with frothy mucous expectoration. A few rhonchi are to be heard on applying the stethoscope over the larger bronchial tubes; but otherwise the lungs are normal. The following mixture was prescribed:—℞ Acid. hydrochlor. dil., ʒi.; tinct. cardamom. comp., ʒi.; aq. ad ℥vj. M. Fiat mistura. A tablespoonful to be taken every four hours. Also a draught, containing twenty grains of chloral hydrat, at bedtime, if necessary. He was to have two pints of milk and one pint of beef-tea during the day. No stimulants.

20*th December*.—Did not sleep much last night. The draught was not given. Skin still perspiring much. Temperature 100·2°. The rash seems darker in colour; the punctations have disappeared; the limits are the same. The pulse is 84, firm. There is still much discharge from the eyes. The other symptoms are as before.

21*st December*.—He slept better last night. There is no headache now. The rash still presents the same appearance as yesterday. Temperature 99·2°. He says his lips and tongue are sore, which is probably owing to some slight fissures. The tongue has still a furred base, with a red margin. The appetite is better to-day. The bowels have been confined for the last two days. The lachrymation is less, but he expectorates more than previously. Pulse 76, firm. He complains of much pain in his elbow, knee, and ankle joints whenever he moves them. There is no swelling in any of the joints.

22*d December*.—The rash is still out, very dusky; there are slight clear spaces here and there on the chest as if it were fading. He slept well last night. The temperature and pulse are now normal; the skin is cool, with a little perspiration. The lachrymation is nearly gone. There is no coryza now. He still expectorates much frothy mucus. There is no pain in the chest. The physical signs are as before. He says that he feels stronger to-day. The tongue is red, moist; the white fur has disappeared. The appetite is good, and the bowels regular. There has been no sore throat for the last two days. He still has the pain in his joints, but it is less severe.

23*d December*.—He was sitting up in his bedroom to-day. The epidermis of his chest was peeling off in large flakes. He expresses himself as feeling well now, except that he is rather weak. From this time he went on well, and made a good recovery.

The chief points which require notice in this case are: 1*st.* The duration of the period of invasion, or that period during which the febrile symptoms existed without there being any rash on the skin. This period lasted four days; and what was also remarkable was, that on the fourth day the patient felt worse in every respect.

2*d.* The appearance of the rash on the fifth day, and its limitation to certain portions of the cutaneous surface. There was nothing different except this from the rash of scarlet fever.

3*d.* The coexistence with these of catarrhal symptoms, beginning on the first day with sore throat, followed by constant and copious lachrymation, with coryza, together with cough and expectoration—the last increasing towards the period of lysis of the febrile symptoms.

4*th.* That, on the sixth day of illness, and second of the rash, a decided lysis of the febrile symptoms took place, as indicated by a fall both in the temperature of the skin and rapidity of the pulse. This lysis was complete on the following day, the seventh of the illness.

5*th.* The rash remained out five days, and did not alter in appearance, except a shade in the colour.

6*th.* On the ninth day, desquamation in large flakes took place, and convalescence was established.

Rötheln, or German measles, like measles and scarlet fever, was for a long time confounded with smallpox. First, the two latter were distinguished from variola, and then measles from scarlet fever, the final distinction being made by Dr William Withering in 1779. Shortly after this, several German physicians separated rötheln from scarlet fever; and prominent among them was Hildenbrand, who gave the disease under notice the name "rubeola"—a name which had been adopted by English physicians for measles. Hildenbrand retained the term "morbilli" for measles. This nomenclature has been used by most Continental writers, and in England by Dr Copland; but in this country the term "rubeola" is generally used to designate measles, the disease under consideration usually being called rötheln. Hebra says, speaking of roseola or rubeola, which he considers the same thing, "Unbiassed observation, however, shows that such cases of roseola are either forms of measles, of slight intensity, in which the catarrhal affection is nearly or altogether wanting, or instances of mild and imperfectly developed scarlatina; or, on the other hand, they might just as well be included under the head of Urticaria. It is, in fact, quite unnecessary to describe by the name of roseola, rubeola, or rötheln a special exanthematic eruption." I will just give Copland's definition of roseola. Willan was the first to describe it: "An eruption of small rose-coloured patches, of irregular forms, very slightly elevated, transient, and passing into a deeper roseate hue as they slowly disappear—the patches being either limited to a part, or to the limbs, or dispersed over the body, preceded and attended by slight fever, and non-infectious." It is worthy of remark, that the rash in roseola is preceded by an invasion febrile period of four days. The question as to similarity is, I think, settled by Bateman, who says, in describing scarlatina simplex: "This species may be easily confounded with roseola; but the progress of the rash is from the face to the trunk and extremities, whilst the reverse of this occurs in roseola."

The period of incubation of rötheln is hypothetically stated by Dr G. W. Balfour to be fourteen days.[1] The disease is defined by Copland thus: "Fever attended by coryza, redness and watering of the eyes, redness and soreness of the throat, pains in the back, head, and limbs, attended on the third or fourth day by the sudden and general eruption of a red efflorescence, which terminates about the tenth day by desquamation: the disease presenting the characters of measles and scarlet fever conjoined."

The period of invasion is variously stated by different authors to be from two to seven days; the mean of which would be four days. This period is attended with the usual symptoms of an ordinary catarrh, such as shivering, pains in the back, head, and limbs, lassitude, and also "heavy" frontal headache, added to a mixture of the primary symptoms of both measles and scarlet fever, as lachrymation, coryza, and slight bronchitis, together with sore throat. There is also want of sleep and prostration. On the fifth day the rash appears; at first it is limited to certain parts, as the chest and arms, afterwards it may become universal. It is said to differ from the eruption of scarlet fever, in that the early punctations are larger and darker in colour. The rash begins to fade after it has been out two days; then the bronchial signs are said to be exaggerated. The rash remains out from five to ten days, when desquamation takes place, the lysis of the fever usually happening when the rash begins to fade. Desquamation takes place in large flakes. There is often a good deal of nervous excitement, such as delirium, at the height of the fever, and the chest symptoms may become serious. The lysis is often accompanied by much perspiration, epistaxis, and loaded urine.

The disease is liable to the same sequelæ as scarlet fever and measles, and prominently among them is acute desquamative nephritis, accompanied with anasarca, which is said frequently to follow an attack of rötheln. The fact of a person having undergone this disease affords no protection from a subsequent attack of either scarlet fever or measles. This has been proved in all the epidemics that have been observed, and is a most powerful argument in favour of rötheln being a separate and distinct fever. Rötheln can propagate itself. This also has been observed in all epidemics, and it has been shown that it does not spread measles or scarlet fever, as those who describe it as a hybrid of these two diseases assert. This was demonstrated in an outbreak in a school at Cramond, which came under the observation of Dr G. W. Balfour. The disease occurs very frequently in the sporadic form. In order to establish what I have to propose on the nature of rötheln, it will be necessary for me to premise the following "on the period of incubation in scarlet fever."

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[1] There was no hypothesis in the matter; it was purely a question of observation; the number of cases under my care during the epidemic being thirty in all. Vide *Edin. Med. Journal*, 1857, p. 718.—G. W. B.

This period is variously defined in books; most of them, however, say "that it is from three to five days to a fortnight or three weeks"—some also adding that the usual period is between the two first figures. I shall attempt to show by cases that it is possible to fix the exact time between the infection of the person by the fever virus and the beginning of the fever. There are many ways by which a person might become infected, the last of which, as a vehicle for the virus, has been discovered in milk.

The method which has been adopted for me—because it is only to be found in the houses of the poorest, where the healthy children are allowed to live and play in the same room with the sick ones—is to observe the exact time between when the rash came out on the first patient and the time when the second began to be ill, and I have, in six cases, involving twelve persons, found it to be exactly three days. I also take as a postulate, that the fever itself is not communicable before the appearance of the rash.

Hildenbrand, who is the first author who gave a full description of rötheln, and has been copied by every subsequent writer, says that some consider it, with Hufeland, Schäffer, Formay, and Heim, as a variety of scarlet fever; and that Kapp, Wickmann, and Reil view it rather as allied to measles; whilst Ueberlacher, Jahn, and Fleisch believe that no essential difference exists between measles, rötheln, and scarlet fever. Copland, a later writer on the subject, considers it a hybrid of these two fevers, presenting sometimes a predominance of the symptoms characteristic of the one, at other times of those distinguishing the other, and not unfrequently an equal combination of both.

I am inclined to think, with Hufeland, Schäffer, Formay, and Heim, that it is a variety of scarlet fever, and should define it as "scarlet fever combined with catarrh,"—the catarrh being coexistent and coetaneous with the entrance of the scarlet fever virus into the body of the patient, the symptoms of the catarrh at once showing themselves, and aggravating what is usually the period of incubation in scarlet fever. My reasons are—

1*st.* The rash of rötheln is the same as that of scarlet fever.

2*d.* The desquamation in rötheln after the disappearance of the febrile symptoms is by large flakes of skin as in scarlet fever, and not by small branny scales as in measles.

These are my reasons for believing it to be a variety of scarlet fever.

3*d.* In rötheln, the period of invasion, taking the mean of all observers, is four days.

4th. The period of incubation in scarlet fever, as I have endeavoured to prove, is three days, the period of invasion being one day; making, in all, four days.

5th. As in the case detailed, the febrile symptoms in rötheln undergo a marked exacerbation on the day preceding the eruption of the rash, announcing as I consider the beginning of the period of invasion of the scarlet fever.

These latter are my reasons for considering the catarrhal symptoms coetaneous and coexistent with the entrance of the scarlet fever virus into the blood of the patient. These propositions may be tabulated as follows:—

	Scarlet Fever.	Rötheln.
Period of incubation, . .	3 days	4 days.
Period of invasion, . .	1 day	

Article IV.—*On Antiseptic Surgery.* By James Cumming, M.D., M.R.C.P.E., L.R.C.S.E.; late Resident Surgeon, Clinical Wards, Royal Infirmary, Edinburgh: Being part of a Graduation Thesis for which a Gold Medal was awarded by the University of Edinburgh, 1st August 1871.

The term antiseptic (αντι, against; σηπτος, putrid) literally means, an agent which has the power of arresting or preventing putrefaction.

Among some of the most efficacious rank carbolic acid, chloride of zinc, and quinine.

Carbolic acid has become intimately associated with what is termed the antiseptic treatment, simply because it was employed as the reagent or medium in the dressings, etc., from its known poisonous properties on the lower forms of infusorial life. The use of carbolic acid as an external dressing, and the "antiseptic treatment," have been by some erroneously supposed to be synonymous terms. That is to say, "that if you simply dress a wound with carbolic lotions or plasters, you are doing all that is necessary in adhering to the principles laid down by that treatment." Now, I need scarcely state, *that the application of carbolic acid as a dressing without any precautions, and the application of carbolic acid on the antiseptic principle, are treatments essentially different.*

It is possible that some day a reagent may be discovered possessing the germicide properties of carbolic acid, and, in addition, qualities which may render it preferable (less of an irritant, although now, the percentage of carbolic acid in the dressings has been so much lessened, that that objection has, in a great measure, been obviated).

Let me give a very brief history of carbolic acid as used generally.

Carbolic acid, the hydrated oxide of phenyl or phenic acid, is a white substance, which crystallizes in long prisms, fusible at 93° Fahr., and boiling at 370°. It has a slight tarry and aromatic smell, resembling that of wood creasote, is freely soluble in alcohol, ether, and glycerine, partially so in glacial acetic acid, and only slightly so in water. It is prepared by treating the oils of tar, which distil between 350° and 400°, with caustic lye; removing the caustic lye solution from the neutral oils, and adding hydrochloric acid to the alkaline solution, when the carbolic acid is set free and rises to the surface as an oily fluid, from which, by distillation, the above therapeutic agent is obtained.

Equivalent — $HO,C_{12}H_5O$, or HC_6H_5O. Specific gravity — 1·065. Appearance—colourless, acicular crystals. There are two qualities, (1) coarse, (2) fine.

It has been known more or less to the chemist for upwards of forty years.

Lebœuf, in 1850, wrote on coal-tar as a surgical application.

Lemaire, of Paris, published a work on phenic acid, mentioning its beneficial effects when used as an external surgical dressing, but laid down no rules for its use. He took no precautions to exclude the atmospheric air *during the whole period of the healing process.*

Grace-Calvert, in 1863, recommended carbolic acid as an application in polypi, ozæna, sore throat, ulcers, hæmorrhoids, lupus, sloughing wounds, and phthisis.

Velpeau, more than ten years ago, used carbolic acid as a disinfectant in surgical operations, but condemned it on account of its causing irritation, and being inferior to other disinfectants.

Wolf, several years ago, recommended carbolic acid in the treatment of phthisis.

Keith administered carbolic acid in small doses in scarlatina, measles, and smallpox, and mentioned the following physiological effects as resulting from its use:—*i.e.*, profuse perspiration, rapid fall of the pulse (as in twenty-four hours from 160° to 60°). Skin cool and moist, subsidence of fever, tongue cleaned, improved appetite. In scarlatina the throat affection is lessened.

Porter, of Dublin, injected a nævus situated on the forehead, immediately above the nose (venous in character, and of the size of half-a-crown), with carbolic acid, repeating the operation seven times, when the mass became consolidated, and in due time was absorbed.

Eade, on the principle of carbuncles and boils being of parasitic origin, after making a free crucial incision, dressed the wound with carbolic oil, 1—5, and met with good results.

Lund, of Manchester, used carbolic acid in its undiluted form in the treatment of lupus.

Sedgwick used it as a gargle in diphtheria and ulcerated tonsils: —℞ Acid. carb., ♏20; acid. acet., ʒj.; mellis, ʒij.; tinct. myrrhæ, ʒij.; aquæ, q. s. ad ℥vi. Solve.

The following compound is alluded to in the *Medical Times:*—

"Liq. carbonis detergens," an alcoholic solution of coal-tar, containing carbolic and other acids, and differing from carbolic acid, as the liq. cinchonæ does from quinine.

Erasmus Wilson used carbolic acid in a case of herpes preputialis, which acted as an anæsthetic, and eventually cured the disease. I have frequently observed the anæsthetic properties of carbolic acid in the treatment of compound fractures, and when applied to superficial granulating sores. It seems to benumb the part.

Yates, of Canada, employed a carbolic ointment to prevent the pitting of smallpox, spread upon black cotton wadding, changed every second day. It seemed to prevent the secondary fever.

Vigla read a paper relating to the use of coal-tar as a disinfectant nearly twelve years ago.

Small doses of carbolic acid have been found extremely useful in the treatment of obstinate vomiting, nausea, morning sickness of pregnancy, etc.

In the form of a vapour, it has been inhaled in gangrene of the lung, ulcerated sore throat, foul breath, phthisis, etc.

Messrs Salt, of Birmingham, have constructed an apparatus for fumigating wards and private chambers.

Russell, of Glasgow, used the vapour in the fever wards of the Glasgow Infirmary.

In short, carbolic acid, more especially of late years, has been tried in most diseases, medical and surgical. It is not surprising that an agent so universally employed should have received much abuse, as well as commendation.

In the year 1864, an epidemic raged among the cattle in Cumberland, and was particularly virulent in the immediate neighbourhood of Carlisle. Among some of the more important disinfectants tried was carbolic acid, which seemed to exert a specific action on the entozoa feeding on the cattle, destroying them effectually.

Dr Lonsdale informs me that carbolic acid was used in large quantities to mix with the sewage of Carlisle, preparatory to that sewage being applied for irrigation upon the pasture lands in the neighbourhood. It was also applied to byres and other outhouses during the rinderpest.

Now, it is evident that carbolic acid proved efficacious in this epidemic, from its direct poisonous action on the entozoa, etc., when other disinfectants would probably have failed. Hence, the question came to be, since carbolic acid has proved so efficacious, will it not prove equally so in the case of those minute organisms constantly present in the atmosphere?

Before entering on the antiseptic treatment, let me offer a few explanatory remarks regarding

The terms Antiseptic and Disinfectant.—Antiseptics (αντι, against, and σηπτος, putrid) literally mean agents which have the power of arresting or preventing putrefaction. Among some of the best known rank carbolic acid, chloride of zinc, and quinine.

Dr Geiselen found that the preservative property exerted on fresh meat by pure quinine was greater than that by many other substances, including cinchona. He first tried it in a case of extensive carbuncular inflammation affecting the lower half of the calf of the leg, which rapidly put on a healthy appearance. Also in a case of noma in a child, where it proved equally efficacious. He then used it in bed-sores, caries, sloughing of malignant growths, etc.

May not the wonderful powers of quinine in malarious fevers, etc., be traced to its action on the lower organisms and minute fungi, which seem to be so closely connected with their origin?

Chloride of Zinc.—As a local application where putrefaction has already taken place, or where the antiseptic treatment is inapplicable, as in maxillary tumours, it is invaluable. Mr C. de Morgan has advocated its use very strongly, but its caustic properties are too severe to be used in general surgical practice (in skin-flap amputations there is a risk of sloughing). There are some situations in the body where it is difficult to fix the dressings, and if perchance the patient, during the night, rub them off, and thus expose the wound, the injection of chloride of zinc, 40 grains to the ounce, is very beneficial, and will completely arrest putrefaction.

Disinfectants.—The term disinfectant has many definitions. It is more, if I may so express it, a medical term, as it is generally used in connexion with fevers, *i.e.*, smallpox, typhus, typhoid fever, cholera, etc. (disinfectans, *dis*, and *inficio*, I infect). The following are some of its definitions:—(*a.*) Mechanical or other agents which destroy miasmata, both odorous and inodorous, or, in short, morbific effluvia. (*b.*) Agents which can remove any impurity from the atmosphere. (*c.*) Substances which can prevent infectious diseases from spreading, by destroying their specific poisons. (*d.*) Antiseptics, or agents that are capable of removing any incipient or fully formed septic condition of the living body, or of any part of it.

The last definition is evidently incorrect, as, in the first place, the terms antiseptic and disinfectant differ etymologically; and, secondly, because the former act by destroying agents which would, if unmolested, create putrefaction.

Then many disinfectants act simply as deodorizers, concealing by their strong odours the effluvia emanating from the part affected. Some are supposed to act by oxidizing, others again by deoxidizing. They have been employed in medicine from the earliest times.

In India, it is a traditional Hindoo custom, when a person is suffering from fever, particularly malarious fever, to keep near him various domestic animals, which are believed to act as absorbents of the noxious principles, or, at least, as preservatives and disinfectants for the attendants. These unfortunate animals are killed by relays, the number employed depending on the resources of the patient.

The observance of the need-fire is an ancient superstition of the north of England. It consists in creating a fire by the friction of two sticks, and collecting a quantity of fuel, by which a great fire is maintained for several days. Cattle affected with murrain, and various epidemics, were supposed to be cured by being held for a short period exposed to the smoke.

The following are some of the more popular disinfectants:—*Chlorine*, *chlorinated lime*, *chlorinated soda*, *permanganate of potash*, *carbolate of lime*, *preparations of sulphur*, *logwood*, *charcoal*, *sulphite of soda*, *iodine*, *bromine*, *hydrochloric acid*, *green vitriol*, *nitrous acid fumes*, *vapour of vinegar*, etc.

Desmartis believes extract of logwood superior to every other agent for disinfecting wounds. He applied it in the form of an ointment to a cancer, and found it immediately destroyed the odour, and also seemed slightly to affect the discharge.

Chlorine has been used largely to disinfect sewers, drains, etc.

Chlorinated soda, a few grains to the ounce, is a favourite disinfectant lotion with some.

The various preparations of sulphur received great prominence at one time. Sulphurous acid lotion was largely used as a dressing, applied in the form of spray, to ulcerated sore throats, and also inhaled. In the Clinical Surgical Wards, this lotion was used to a considerable extent, before the introduction of the antiseptic treatment. A small quantity of sulphite of soda was placed in a saucer, and some sulphuric acid poured over it. Thus, by chemical decomposition, sulphate of soda was formed, and the sulphurous acid gas liberated; and it certainly removed, to a slight extent, the offensive odour from the wards. But this treatment did not seem to exert any beneficial influence on the wounds, nor had it any effect in reducing the average of erysipelas, hospital gangrene, or pyæmia.

Polli, of Milan, on the principle that many blood diseases were the result of some morbific ferment, and that some remedy might be given which would neutralize this, recommended the sulphites of soda and magnesia. He found, as the result of some experiments, that if a dog be previously sulphited, it will survive an injection of pus, which, under ordinary circumstances, would have proved fatal.

The hyposulphites have been largely administered in surgical practice, in the hope of acting as preventive in cases of pyæmia, but without any satisfactory results.

Dr C. Paul, in an outbreak of cholera, used a solution of the hyposulphite of soda as a disinfectant for the extremely offensive emanations, and stated that it proved a great comfort to those in attendance. Also in the form of enemata, which not only destroyed the odour of the emanations, but gave considerable relief to the patient. He then used it sprinkled on napkins, as a preventive of puerperal fever, when it was found to act also as an anæsthetic.

Bonjean, of Chambéry, recommends a mixture of charcoal and sulphite of iron, to be used as a disinfectant in cholera.

In the Clinical Surgical Wards, Condy's fluid, sulphurous acid, and carbolic acid, were largely used, simply laid upon the wound as dressing, without antiseptic precautions; but had no effect in controlling putrefaction—amply testified on opening the folding doors which shut off Mr Syme's department from the rest of the hospital, when one was greeted with a draught of this offensive odour.

Introduction of the Antiseptic Treatment.—For several years previous to 1864, Professor Lister had directed his attention to the subject of suppuration, more especially in its relation to putrefaction, and had employed various disinfectants, such as Condy's fluid, etc., in large quantities in the treatment of wounds, but with no marked results.

It was not till the spring of 1865, that he first used carbolic acid, according to the antiseptic principle (in a compound fracture, which, however, proved unsuccessful from improper treatment). The next case was in August 1865, when a compound fracture of the leg was treated with liquid carbolic acid, and made a good recovery. The strong carbolic acid mixing with the blood, formed a hard crust, which mechanically effectually excluded the air, and prevented putrefaction occurring in the deeper parts, and thus many a serious wound healed, and became soon superficial under this treatment. But there were certain disadvantages connected with this, as, for instance, if the blood continued to ooze for some time after the application of the acid, the latter was washed away, and thus its power was lost. Then, again, carbolic acid is very volatile, and requires something to retain it. Sheet-lead, and afterwards block-tin, were introduced to act as a "protective" to the crust.

The antiseptic principle may be best explained by taking an illustration from the treatment, say, of

Compound Fractures.—A simple comminuted fracture will make a rapid and good recovery, even if accompanied by considerable bruising. But if a wound, however slight and apparently trivial, communicate with the seat of fracture, even if there be neither bruising nor comminution, it at once renders the case serious, and a cause of anxiety to the surgeon. This seems strange, until accounted for.

From earliest times, the numerous alterations in surgical dressings have been founded on one great principle, viz., *exclusion of the air;* all authors recommend, if possible, the conversion of the compound into the simple fracture, by closure of the external wound, that the risk of putrefaction and suppuration may be avoided. Many who have written on this subject, state that the atmospheric air gaining access to the seat of fracture causes the dangers that we apprehend.

That the air must at all times contain some noxious element (not a gaseous compound), is simply a matter of logical inference. We know from the researches of Pasteur and others, that it is not a vapour or a gas; that it is something solid, something which, by mechanical appliances, can, if not excluded, be at any rate deprived of its poisonous influences. Now, we cannot apply an apparatus to a wound which will effectually exclude the air (as in the infusion preserved by the hermetically-sealed flask), as the discharge must be allowed free vent. Again, it would be equally impracticable to apply an apparatus (as in the flask with contorted neck) to filter the air. But we may apply an apparatus that will act directly on the solid particles floating in the atmosphere, and deprive them of their influence. Carbolic acid possesses this property, and therefore has been employed as the reagent or medium.

Some have stated that the antiseptic treatment consists in the exclusion of the air. I need scarcely reiterate, that this is quite erroneous, and at variance with the principle. *The atmospheric air is purified (filtered) not excluded.*

From the introduction of this mode of treatment in the spring of 1865 to the present time (May 1871), although many alterations in the character of the dressings have taken place, the principle is always the same. The plan of washing-out the interior of the wound with carb. lot., and dressing it under the protection of the spray, reduces the risk of putrefaction to a minimum, and is especially useful in cases where the wound is large, and where a considerable interval has elapsed since the receipt of injury.

Several years ago, when carbolic acid was used in a much more concentrated form than at present, it was not uncommon to find, on removing the crust covering the wound, a small quantity of pus ooze away. This was simply due to the stimulating action of the acid on the tissues, inducing granulation and suppuration (antiseptic), which latter must not be confounded with suppuration consequent on putrefaction.

I am convinced that a much weaker proportion of the acid is quite sure to ensure complete absence of putrefaction.

To ensure healing without suppuration, we must not only prevent the spread of putrefaction, but also protect the raw surface from the stimulating action of the acid (by introducing a "protective" between the raw surface and the dressings). In connexion with compound fractures, let me direct your attention to a few interesting pathological facts.

Organization of the Blood-Clot.—In a case of compound fracture of the leg, in May 1866, on examining the crust some weeks after, the deeper portion was found to have become converted into living tissue. Now, in many cases of compound fracture since then, when the wound has been dressed, first, every day, and then every second day, the entire clot was found after a time to have become organized (proved by gently scraping the surface, when blood was seen to ooze away). Observed in cases 2, 5, 11, 12, 56, and 61. The first case in which I observed this was in a compound fracture of the radius, caused by indirect violence, where the small wound produced by the fragment passing through the soft parts was closed by a clot of blood, which, instead of decomposing, remained soft and intact, till, on gently scraping it some weeks after, it was found to be closely incorporated with the surrounding tissues, and bled slightly. The second case was in a compound comminuted fracture of the leg, caused by direct violence, where a clot of considerable size was, on the second day, observed to close the orifice of the wound, and which, as in the preceding case, remained soft and intact, eventually becoming living tissue. (At one time, in this case, on account of the serious nature of the accident, it was feared that sloughing might ensue, with disorganization of the clot; but neither happened, the case progressing as successfully as any of the others.) The third case was also a compound fracture of the leg, the result of direct violence, where the wound was small, and, considering the exciting cause, did not promise favourably; as, if deep-seated suppuration occurred, the pent-up discharge would have proved a very serious complication. But the discharge being trifling in amount, the clot was allowed to remain, eventually becoming organized. The fourth case was one of compound fracture of the forearm, where this interesting point was again observed. The fifth case, a compound dislocation of the ankle, the result of direct violence, where, after some time, the clot was observed to be of an orange-brown colour, and which bled on being scratched. The sixth case was after an operation for a badly-united fracture of the forearm, where the clot covering the wound became converted into vascular tissue.

John Hunter once remarked, "*If you allow the clot of blood over a small wound in a compound fracture to form a crust, the blood beneath becomes organized and absorbed as in a simple fracture.*" The explanation is evident: when the blood coagulates and forms a hard crust, it protects the parts beneath from the influence of the atmosphere, and thus freed from irritating influences becomes rapidly organized. Now, the antiseptic dressings act on exactly the same principle, by protecting not only the parts beneath, but also the surface of the crust (superficial parts) from the noxious influences of the atmosphere, and thus complete organization is allowed to take place. Again, if oozing to any extent occur, in John Hunter's case, the clot is necessarily prevented from forming. But the antiseptic treatment has this advantage, that even after considerable oozing, the clot will form. (Observed in several cases the result of direct violence.)

The next pathological point of interest of equal importance with the preceding is

The Organization of Sloughs.—It is apparently of the same nature as that which occurs in subcutaneous injuries. In a severe simple fracture, the soft parts bruised, and perhaps lacerated beneath the skin, undergo in process of time a change by which they become as it were reorganized. Again, bruised and lacerated patches of skin, etc., when left exposed to the air, putrefy, and this putrefaction may spread through the subcutaneous tissues till it reaches the seat of fracture. Now, there is no reason why, in a compound fracture, provided the bruised parts surrounding the wound be protected from the action of the atmosphere, the textures immediately beneath the skin should not also become reorganized, as in the simple fracture. The following rule may be kept in mind in connexion with what I may now fairly term, the "*Preventive Treatment of Sloughs.*" *In compound fractures and wounds generally; the result of direct violence, if on the second or third day a dusky discoloration on the skin—in short, if you have any reason to anticipate sloughing—treat that part exactly as if it had been a wound (see that the dressings overlap the entire portion of the discoloration), remembering, also, to interpose the "protective," which will prevent the risk of superficial antiseptic suppuration.*

The following cases will serve to illustrate the above remarks. See cases 5, 6, and 56. In the first case, several days after the accident, a patch two inches square was observed to be *white* and *dead* (and from the remarks of Mr Syme, we were prepared for sloughing of that portion). The area of this dead portion gradually contracted; a distinct red line marking its original dimensions, and eventually a few fine scales were all that separated, showing that the subcutaneous structures had become reorganized. Now, if sloughing and suppuration had occurred with their attendant evils, irritative fever, etc., how different, probably, would have been the result! In the second case, a compound fracture of the humerus, from the character of the injury, and the appearance of the wound, sloughing might certainly have been anticipated. In the third case, a compound dislocation of the ankle, sloughing of the skin, etc., was prevented by the antiseptic precautions. The following case shows how, the "preventive" treatment being neglected, a large slough separated. I remember, in October 1869, in a case of simple fracture of the humerus, admitted into Ward V., the result of the blow from a winch, a discoloured patch appeared, and eventually a portion of it sloughed, confining the patient for several weeks to his bed.

Professor Lister records a case of compound fracture of the forearm, in which the antiseptic treatment had been pursued with thoroughly efficient means; but after the lapse of some days he was asked to look at the limb, in consequence of unsatisfactory appearances. The dressings had been applied perfectly correctly, but the wound emitted an offensive discharge. On investigation, a small slough was observed, about half an inch in diameter, situated some inches from the wound, and just beyond the limit to which the lac plaster had been extended. On injecting some of the watery solution into this slough, it passed freely beneath the integument to the seat of fracture, and to the external wound. Had all the discoloured patches in this case been well overlapped, this would have been avoided.

The next point of interest in connexion with compound fractures to which I wish to direct your attention, is

The Organization of Bone.—Observed in cases where the bone has been exposed (subantiseptic) for some time, and eventually become covered with granulations neither separating nor causing the slightest constitutional disturbance. Let me refer you to cases 8, 20, 36, and 56. In the first case, a severe compound comminuted fracture, where a portion of the tibia 2½ inches in length lay exposed and to all appearance dead. After a time little granulations appeared, which gradually covered the bone, and no exfoliation occurred. (If necrosis had set in, the patient would, in all probability, have lost his limb.) In the second case, when operating for a periosteal abscess, a considerable portion of the tibia was found to be bare. Healing rapidly took place without any exfoliation. In the third case, a portion of the frontal bone, about half an inch in diameter, lay bare, and eventually became covered with granulations, unaccompanied by constitutional symptoms. In the fourth case, an exposed portion of bone, resulting from a scalp wound, healed without any exfoliation, etc. Professor Lister records a fifth case, where, in a compound fracture, "an extensive portion of the shaft of the tibia had lost its vitality, and lay exposed in a large granulating sore. The granulations grew up and enclosed the dead bone, which, being prevented from putrefaction, was destitute of the usual acrid properties of an exfoliation, so that the granulations, being not stimulated by it, not only formed no pus from the surface in contact with it, but gradually consumed the dead mass by absorption."

The results of the above cases teach us that, in cases of compound fracture, where, in consequence of the severity of the exciting cause (even if sloughing does occur), a portion of bone lies exposed, necrosis, etc., may be prevented by carefully persisting in this treatment.

In connexion with compound fractures, a chapter was devoted to "The Mode of Dressing a Compound Fracture, its History and Progress, from 1865 to 1871," which must be omitted in this extract, with the exception of the mode followed in 1869–70.

On 27th December 1869, a compound fracture of the leg was treated as follows:—The patient having been removed from the cart to the general waiting-room (previous to his removal to the ward), a quantity of carb. lot. 1—40 was poured upon that portion of the stocking from which the blood trickled. His trousers and boots were then gently removed; the stocking slit up on the opposite side of the limb from the wound, and then removed under a stream of carb. lot. A piece of calico dipped in the solution was then slipped on the wound. The nozzle of the syringe, containing about 4 oz. of the lot. 1—20, was introduced into the wound, and freely injected in all directions, the external parts being at the same time kneaded to allow the lotion to permeate the neighbouring tissues. A piece of oil-silk, 2 × 2 inches, dipped in the watery solution, was then placed upon the wound (slipping the guard from beneath) to act as "protective;" then four slips of lac plaster 1—3 wrapped round the limb, extending several inches above and below the wound, applying a double layer over that part corresponding to the wound; dressing-cloth and bandage; side pasteboard splints, well padded; provided with a "bird-nest" for the external malleolus; a couple of Gooch splints to mould them to the limb. The limb was then laid on its outer side. On the following day the dressings were changed in the usual manner, with the assistance of the syringe and guard.

At the present time (May 1871), antiseptic gauze has been substituted for the lac, and this, I may mention, has several advantages. It is porous, allowing the air (purified, that is, rendered aniseptic) to reach the parts. (In fact, even when in many folds you can breathe through it like a respirator.) It renders the application of dressing-cloths unnecessary, and thus simplifies the process. The green protective is substituted for the oil-silk, and a hand spray-producer for the syringe.

On Granulation and Suppuration.—Professor Lister (*Phil. Tran.*, 1858) demonstrated, thirteen years ago, "that the tissues of the living body are liable to a temporary impairment or suspension of vital energy, as the result of extreme irritation, and that this condition may be brought about in two ways—(1.) Either by the direct operation of a noxious agent upon the tissues; or (2.) Indirectly through the medium of the nervous system. That this is also true with regard to the causes of the exaggerated but feeble cell-development, which results from the continued action on the tissues of some abnormal stimulus in a less intense form, giving rise to the various phenomena of inflammatory hypertrophy, granulation, and suppuration; the pus-cells being the extreme of excess of quantity and impairment of quality in the products of abnormally excited nutrition."

Thus Mr Lister divided the causes of suppuration into two groups—first, those that operated through the nervous system; and, second, noxious agents or stimuli acting directly on the tissues. The results of the following three simple experiments will serve to illustrate the latter of the two causes of suppuration:—

Exp. 1.—On a small granulating surface apply a piece of block-tin (fitting closely to the surface), and fix it with broad pieces of adhesive plaster. On removing this on the following day, the discharge from the sore will be found to consist of thin serum, and no pus.

Here, the access of air is effectually prevented, and putrefaction does not occur. I remember observing this in a case of carbuncle in Ward V., where, some time after the operation, a healthy granulation formed, which gradually healed by contraction. It was situated posteriorly between the scapulæ, in an admirable position for the experiment (a flat surface).

Exp. 2.—Leave another granulating surface exposed to the air, or dress it simply with water-dressing, and in twenty-four hours the granulations will be found to be studded with little points of pus.

Suppuration is here induced as the result of putrefaction (noxious agents from the atmosphere).

Exp. 3.—Dress a third granulating surface with a concentrated solution of carbolic acid, and, in a corresponding time, it also will be found to have secreted pus.

Suppuration is here induced by the direct stimulating action of the acid (destroying the vitality of the tissues superficially). This latter form is termed "antiseptic suppuration."

The above observations show that granulations have no inherent tendency to form pus.

Abscess.—Professor Lister, in the *Lancet* of July 1867, alluded to the difference between compound fractures and abscesses. "In the latter, there has been no communication with the air, and, therefore, no septic organisms are present in the interior to give rise to putrefaction. It is only when the abscess has been opened, and free access allowed to the air, that suppuration is induced. The lining wall of an abscess is similar in nature to the granulations of a sore, and has been regarded by many as essentially 'pyogenic;' but if the abscess be opened antiseptically, the pyogenic membrane being relieved from the inflammatory stimulus which the tension of the pus before induced, and being at the same time protected from the access of the stimulus of putrefaction, is left free from all disturbance, and never forms another drop of pus."

In evacuating an abscess, all the contents should be steadily pressed out under the curtain (as the pyogenic membrane is not injured thereby). So different from the old treatment of applying a poultice to absorb what remains after the operation. I may state here that, at the first dressing after the operation, you not unfrequently find several drops of pus on the cloth; but this is merely what has not been pressed out on the previous day.

In the treatment of abscesses, surgeons, from the earliest times, seem to have been aware of the evil effects following the admission of atmospheric air. Abernethy, on the supposition that the bad symptoms which so often supervene on the opening of a chronic abscess were due to the entrance of air, recommended a small valvular opening. Again, the treatment of evacuating a chronic abscess by the trochar and canula, or the exhausting syringe (by no means recent), is founded on the principle of excluding as much of the atmospheric air as possible. But there are disadvantages connected with these forms of treatment, as, if a small quantity of the pus remain, it decomposes, and gives rise in many cases to irritative fever, etc., attended often with profuse suppuration; and death by pyæmia is not of very unfrequent occurrence.

The "antiseptic" has, as in wounds generally, materially altered the treatment of chronic abscesses, abscesses connected with joints, and abscesses in connexion with diseased bone.

Chronic Abscess.—Under the old treatment, we are taught to be chary in opening them in patients of weak, strumous habit, as bad consequences are apt to follow. Thus, a favourite treatment with some, is to draw off the contents at stated intervals, which may prolong the case for many weeks. The drainage-tube is also tedious, and seems to keep up the suppuration by acting as a local irritant; but, with antiseptic precautions, we may confidently lay a chronic abscess freely open, and have the best results. See cases 16, 24, 25, and 28.

Abscesses in connexion with Joints.—Mr P. Hewett says, "that in cases where we have reason to conclude that pus has formed in the joint, rest and discutient remedies should be persevered with as long as there is any chance of absorption," referring probably to the danger of irritative fever, etc., following the operation.

Suppuration in the joint may be followed by superficial erosion or disintegration of the cartilage, and eventually complete disorganization of the interior of the articulation, and to more or less complete anchylosis. Is it not, then, a great advance in surgery when, confident in our treatment, we can freely evacuate the pus, and have a speedy recovery unaccompanied by constitutional disturbance? Let me refer you to cases 44, 45, 46. In the first case, as a proof that putrefaction had not taken place, a large plug of lint was extracted perfectly "sweet," after having lain embedded in the tissues for the long period of six weeks. The second case seems to illustrate how rapidly a joint will heal when laid freely open with antiseptic precautions. The third case slso shows us how a suppurating joint may be freely laid open, all the contents freely squeezed out, and yet heal rapidly.

Abscesses in connexion with Diseased Bone.—It has long been considered dangerous practice to evacuate an abscess in connexion with diseased bone, as the risks of such sequelæ as profuse suppuration followed by hectic fever are great. But cases 31, 32, 33, and 34 show that an abscess in connexion with carious bone may be opened and still be followed by good results. I remember hearing Mr Syme remark, after evacuating a very large psoas abscess by a free incision (antiseptically), that "formerly he would have feared giving vent to the matter on account of the dangers of profuse suppuration, hectic, and emaciation, but now he was confident the patient would rapidly recover his health." The result proved that he was right. In the Appendix are detailed a few cases of lumbar and psoas abscess treated successfully. There were either two or three perfect recoveries during the winter session of 1869, but I have not been able to find full reports of them.

Concluding Remarks on Abscess.—That acute abscesses, when evacuated subcarbolically, heal rapidly, see cases 13, 15, 18, 21, 26, and 27. Complete absence of constitutional disturbance is another point observed by those who have given this treatment a fair trial.

Dr Bernard, senior Surgeon to the Royal Naval Hospital, Plymouth, informed me more than a year ago, that what first drew his attention to the antiseptic treatment was the marked change after evacuating an abscess antiseptically, from the treatment he had formerly pursued, by the absence of constitutional irritation, etc. He eventually published some instructive cases in the Naval Blue-Book, 1870.

There is no doubt that irritative and hectic fever are due in great measure to putrefaction, and therefore we can easily account for their absence when antiseptic precautions have been faithfully carried out. Let me add, that some of the objections formerly urged against this treatment are entirely surmounted by the present applications. (Carbolic paste was considered uncleanly and difficult to manage.) Nothing could be more simple, nothing more cleanly, than the application of prepared gauze folded two or three times.

I shall allude further on to the pathology of lumbar and psoas abscess, when speaking of the effect of the antiseptic treatment on diseased bone.

The Mode of Dressing an Abscess: its History and Progress from 1866 to 1871.—1866. Briefly as follows: A piece of rag, 4 by 6 inches square, is dipped in a sol. of carb. acid and olive or linseed oil 1—4, and laid upon the skin where the incision is to be made. The lower edge being raised, while the upper is kept from slipping by the finger of an assistant, the bistoury, dipped in the above sol., is plunged into the cavity of the abscess, and an opening of about ¾ of an inch made; the instant the knife is withdrawn the rag is dropped upon the skin as an antiseptic curtain, beneath which the pus flows out. The cavity of the abscess is firmly pressed so as to force out all existing pus as nearly as may be, and, if there is much oozing, a piece of lint dipped in the above sol. may be introduced into the wound, to act as a drain, doing this under the curtain, and then immediately dressed with carb. paste spread upon a sheet of block-tin 6 in. square, forming a layer ¼ in. thick. The tin is then fixed by adhesive plaster, and a folded towel placed over, to absorb discharge, secured by a bandage. To change the dressings, a second piece of tin spread with putty is prepared; then a piece of lint dipped in the oily sol. is placed on the incision the moment the tin is removed, so that the discharge may be squeezed out beneath it. The strength of the putty may be reduced to from 1—5 or 1—6, if necessary. In probing an abscess, dip the probe in an oily sol. and introduce it between the folds of the rag. A piece of lint dipped in carb. oil 1—4 may be put next the skin and maintained there permanently, care being taken to avoid raising it with the putty. When all discharge has ceased, the rag is left adhering to the skin, removing the putty, and allowing it to heal by scabbing.

1868.—A double layer of plaster (lined with gutta-percha and brushed over with bisulphide of carbon) was substituted for the paste dressing.

1869.—The precautions for evacuating the abscess remain unaltered (anoint the neighbouring parts well with the oily sol., and remove any hairs). A strip of lint, dipped in carb. oil 1—10, may be introduced into the wound to act as a drain. A new preparation, consisting of shell-lac 1—3, is applied as dressing, overlapping the wound by several inches, fixed by pieces of adhesive plaster 2½ inches in breadth (applied equally on the plaster and on the skin). The syringe, charged with carb. lot., is used in changing the dressings, inserting the nozzle beneath the edge of the plaster to refresh the wound. In morbus coxarius the following lot. may be injected into the sinuses, to prevent putrefaction:—℞ Spt. methyl., ℥v.; acid. carb., ℥i.; solve. Shell-lac plaster 1—6 may be used after the discharge has lessened in amount.

Aug. 1869.—A plug of lint, soaked in carb. oil 1—20, may be used as a drain. A double fold of lint dipped in the same sol. laid over the wound covered by oil-silk, dressing-cloth, and bandage.

Dec. 1869.—The oil sol. is altered to 1—5, and copal plaster used as protective. Putrefaction may be prevented, or at any rate arrested, by injecting ℞ Zinci chloridi, gr. xl.; aquæ, ℥i.; solve.

If an abscess is pointing, but you wish to postpone opening it for a day, it may be as well, as a precautionary measure, to apply the dressings in the usual manner. If it should burst, it is in an antiseptic atmosphere.

May 1871.—Antiseptic gauze is now employed as a substitute for the lac, secured by gauze bandages. The green protective is used as formerly.

The Effect of the Antiseptic Treatment on Caries.—Caries has always been regarded as a very formidable affection, and by many as incurable (except in situations where it can be completely removed by operation). Mr Syme at one time compared it with cancer, on account of its obstinacy. Professor Lister regards caries as "merely the suppurated stage of chronic inflammation in a weak form of tissue, and that it exhibits the tendency of inflammatory affections generally, viz., a disposition to spontaneous cure on the removal of the irritation." Mr Syme latterly remarked, that "caries is the effect instead of the cause of suppuration." We know that necrosed bone lying exposed for a considerable time may not only be completely covered, but even absorbed, if antiseptic precautions be persevered with throughout. As confirming Mr Lister's remarks, let me refer you to cases 31, 32, 33, 34, and 37, of which the first four are all cases of psoas abscess connected with diseased bone; and in two, fragments of diseased bone were detected in the discharge. The fifth case was one of caries of the elbow-joint, treated successfully. Dr C.'s case illustrates how patience and perseverance may be rewarded.

The Effect of the Antiseptic Treatment on Affections of Joints.—The conservative influence of the antiseptic treatment on surgery, is well exemplified by its results in the treatment of joints generally, more especially in diseases of the knee-joint. In bursitis patellæ, we do not hesitate to operate by a free incision. The injection of stimulating lotions, such as tincture of iodine, etc., is quite unnecessary, as the membrane has no tendency to form pus (treated antiseptically). See case 40.

Loose Cartilages of Joints.—The method of removing the cartilage by the direct operation may be adopted fearlessly. It is the simplest and most effectual treatment, provided we are safe from the risk of suppuration, etc. See case 43, and one of Mr Bickersteth's, where the wound in both cases healed rapidly, unaccompanied by fever, etc.

Suppurative Synovitis, generally regarded as a very formidable affection of the joint, may be treated "radically" with confidence. See cases 44, 45, and 46.

Tumours of the Mamma.—Professor Lister has adopted, in scirrhus of the mamma, a most effectual mode of treatment for the removal of the disease, viz., dividing the pectoral muscles and dissecting out the axillary glands. Patients on whom this operation had been performed recovered as rapidly as cases of removal of simple adenoid growths; see cases 48, 49, 50, and 51. The peculiar odour proper to the axilla and groin was remarked in several of the above cases. It must not be confounded with that of putrefaction.

Tumours of the Superior and Inferior Maxilla.—The application of an external antiseptic dressing would be useless, as the contents of the mucous cavity constantly furnish the germs of putrefaction. But a strong solution of chloride of zinc has been found to answer admirably, having a remarkably persistent antiseptic influence, the discharge remaining "sweet" for several days. It is a great improvement on the old treatment of plugging the cavity with lint (unprepared), which when extracted, after a few days, is very offensive from decomposition. Case 62 shows how Condy's fluid was tried on account of the fetid odour, but did not seem to have been effectual. For cases illustrating the use of chloride of zinc, see 63, 64, and 65.

Burns and Scalds.—In the Appendix are detailed a few cases of burns and scalds, where the application of a mixture of carbolic acid and Carron oil, covered by gutta-percha tissue, was employed. Carbolated wool may also be used with advantage.

Effect of the Antiseptic Treatment on the Ligature of Arteries.—Professor Lister states, "that when an ordinary ligature is applied to an artery the internal and middle coats are ruptured, while a portion of the tough external coat is pinched together and deprived of its vitality. The dead tissue, being contaminated by the putrefaction which occurs in the interstices of the silk fibres, acts, together with the septic ligature, as a cause of irritation to the neighbouring parts of the arterial wall, which consequently degenerates into an imperfect structure, inadequate to withhold the powerful cardiac pulse; hence, if a considerable branch takes origin close to the part tied, the formation of a clot being prevented by the current of blood, secondary hæmorrhage is the inevitable consequence." Thus, it is evident that the great risk in those cases is putrefaction, occurring at a point where the vessel is of degenerate structure, and sudden hæmorrhage taking place. But being able to prevent this putrefaction, we thus have a direct control over suppuration, one of the commonest causes of death. We can readily comprehend that if large portions of dead tissue, pieces of exposed bone, and blood-clots become organized, how the small dead portion of the external coat of an artery becomes, after a time, absorbed.

In this treatment silk ligatures were first used, which had been steeped in a watery sol. of carb. acid. They caused no irritation, remaining embedded in the tissues, just as any hard impermeable substance, but were, of course, not absorbed. Catgut ligatures were next tried and proved successful in an eminent degree. They are prepared by suspending the catgut in a mixture of carb. acid, water, and olive oil (in the following proportions—carb. acid crystals 25 oz., water 1¼ oz., and olive oil 125 oz.), so that it may be kept clear of the water (precipitated). The vessel should be kept cool, say at a temperature of 46° F. The ends are cut close off at the knot, which eventually become absorbed.

Let me briefly state the result of the following experiment:—

Ligature of the Common Carotid of a Rabbit with Catgut.—18*th March* 1871. The animal being put under chloroform, an incision about two inches was made, and the skin carefully divided. On dissecting down, a very large vein was exposed, which lay superficial to the sterno-mastoid. This was gently held aside by a blunt hook; the artery was then exposed, lying close to the trachea, having the pneumogastric nerve on its outer side. Two ligatures of the thickest kind of gut were applied, the ends cut short, and the intermediate portion of the vessel removed and submitted to microscopic examination (to be quite sure it was the artery). The wound was then carefully sponged out with carb. oil 1—5, and the edges brought together with prepared silk sutures. Several folds of lint dipped in this lotion were then applied as dressing, and the animal placed in a basket before the fire. The instruments, etc., were dipped in the 1—40 lot. The animal cried a good deal when first put under chloroform, and seemed to be thrown into a state of hyperæsthesia. About an hour after the operation it was nibbling at its food as if nothing had happened.

19*th March.*—The boy who has charge of the rabbits informs me that this rabbit consumed a greater quantity of food in the twenty-four hours than another, which had not been experimented on.

23*d March.*—Wound perfectly healed; animal quite healthy; no suppuration. Exactly three weeks and two days after the operation, the animal was killed.

Post-mortem Examination.—The skin was reflected by a quadrilateral flap including the cicatrix. The textures beneath the cicatrix were slightly adherent. Both knots were exposed (the cardiac one dissected down to the heart, which was removed along with it). *General appearance.*—On making a section of one of the knots, a dark speck was observed in the centre, which, on being gently drawn out by the point of a needle, proved to be the artery, reduced to about one-fifth of its original size, and firmly embedded in the surrounding tissue, which had a faintly pink hue, as if injected. *Microscopic examination.*—On making a fine section of the knot, and teasing it out with needles, it was found to consist of delicate parallel wavy lines—in short, areolar tissue (showing its ordinary characters). On the addition of acetic acid, the field became almost transparent, and showed a good many nuclei. There was not sufficient time allowed for the entire absorption of the ligature, as the animal was killed only three weeks after the operation. This was done purposely to observe how far matters had progressed. I may add, that, in the dissection, the knots were with difficulty separated from the surrounding tissue, with which they had become closely incorporated. Thus it was evident, that the greater portion of the ligature had become organized.

The Mode of Dressing an Amputation: its History and Progress from 1866–71.—1866. Amputations were dressed at this time in a similar manner to compound fractures. Large pieces of lint, soaked in carb. acid, applied, enveloping the stump, covered with gutta-percha or lint, dipped in the oily sol.

1867.—Carbolic paste, applied in the same manner as in abscesses.

1868–69.—Amputations were dressed with indiarubber tubes as follows:—The stump was enclosed in an indiarubber tube, and a knot tied at the face of the stump. Then a fold of lint, dipped in the following sol., placed within the tube, and a second knot applied, keeping this close against the stump, but not touching it: ℞ Acid. carb., ℥i.; glycerine, ℥iv. Solve. Then two long strips of lint, dipped in the same sol., applied around the upper part of the stump to act as antiseptic reservoirs. A folded towel wrapped round the upper part to absorb discharge, and the stump laid on a pillow. The tube is easily removed (like pulling off a finger-glove), the nozzle of the syringe being inserted beneath to refresh the wound, and a large piece of calico dipped in the 1—40 sol. slipped on immediately on the withdrawal of the tube. The lint, dipped in the glycerine sol., is then changed, and the dressings reapplied. Thus the wound is exposed to a constant antiseptic atmosphere.

I have entered into this rather minutely, as it explains so well the "principle." The dressings do not come in actual contact with the wound, but still preserve it in a thoroughly antiseptic atmosphere. This also serves to explain the principle on which the antiseptic acts when applied in cases of psoas abscess.

1869.—A large 40-oz. bottle of carb. lot., 1—40, is taken into the theatre, from which the basins are filled. One basin is placed aside, into which all the instruments to be used are dipped. The sponges are also wrung out of the lotion. The saw is anointed with oily sol., 1—10. The operator and his assistant dip their fingers in the lot. The large vessels secured with catgut, the ends cut short, and the smaller ones twisted. The wound is then sponged out with the watery sol., and the flaps brought together, except at the most dependent part, to allow vent for the discharge. A strip of lint, dipped in the oily sol., 1—10, is introduced into the wound to act as a drain. Then the stump is enveloped in a double layer of lac, 1—3 (stripped of its calico), and a large piece of oil-silk applied, to prevent the risk of air entering by any cracks. Dressing-cloth and bandage. It should be dressed on the following day as follows: Remove the plaster gently, inserting the nozzle of the syringe; then slip on the guard. Take an ordinary towel, and soak it in the watery sol., 1—20, and apply it, so as to envelop the stump (funnel-shaped), so that, lifting the edges, you may examine the stump and remove the drain. Then a broad piece of lac is applied around the stump and towel; from the interior of which the latter can steadily be withdrawn, closing the lac over the face of the stump. Then apply the dressings in the usual manner. On the fourth day, a strip of lint, two inches in length, dipped in the 1—20 carb. oil, may be applied along the wound as "protective." If the stump require strapping, cut two strips of lac, and with a dry towel remove the gutta-percha. Then lay over it pure carb. acid.

Nov. 1869.—A towel soaked in the following sol. was wrapped round the stump and kept moist during the first twenty-four hours: ℞ Acid. carb., ʒi.; glycerine, ʒv.; water, ʒxx. Solve. A piece of lac, 8 × 8, laid on the pillow to act as an antiseptic basis. On the following day it is dressed in the usual manner. The stitches (that were merely inserted loosely) are tightened as follows: An assistant steadily drops the lotion on each stitch as it is being tightened, and a little piece of calico is at the same time slipped on it, and so on till they are all finished. The "protective" is pinned to the guard, and thus applied.

1871.—Amputations are performed and dressed under the carbolic spray. Prepared gauze applied as dressing with green "protective."

The following is a list of the various preparations used in the Antiseptic Dressings, 1866–71:—

1866.—Liquid carbolic acid.

1867.—Carbolic paste.

1868.—(*a.*) Emplastra. (*b.*) Bees-wax; carbolic acid. (*c.*) Emp. plumbi; bees-wax, $\frac{1}{4}$; carb. acid, $\frac{1}{10}$. (*d.*) Shell-lac. (*e.*) Shell-lac; gutta-percha. (*f.*) Shell-lac, 3; gutta-percha, 1; carb. acid, 1; bisul. of carb., 30. (*g.*) Shell-lac, 6; carb. acid, 1.

1869–70.—(*a.*) Shell-lac, 3; carb. acid, 1.

The "Protective."—(*a.*) Carbolic acid; blood. (*b.*) Calico dipped in the oily sol. (*c.*) Sheet-tin.

1869.—Oil-silk; watery sol. Gum copal, 3; carb. acid, 1.

Feb. 1870.—Oil-silk, coated with copal, and brushed over with carb. acid and dextrine; gold-leaf.

On Fermentation and Putrefaction.—Pasteur stated that there are at all times suspended in the air organized corpuscles; that the dust of the air, when placed in the presence of an appropriate liquid, in an atmosphere of itself quite inactive, gives rise to various products, such as the Bacterium Termo, and many varieties of fungi. Again, that the lactic and butyric fermentation were always associated with the presence of organized beings; that, in fermentation, yeast, appropriating a certain percentage of sugar, causes the rest to be transformed into carbonic acid and alcohol (the products of fermentation; that the presence or absence of oxygen was immaterial to the production of putrefaction and fermentation.

With regard to Fermentation.—The investigations of Redi, Schwann, Helmholtz, Ure, etc., proved that putrefaction was caused by solid matters constantly present in the atmosphere, which only required time and a suitable nidus to develop themselves.

That the atmospheres of certain localities are more prejudicial, as it were, than others to putrefaction, is to be inferred.

Let us see what bodies may be found in the neighbourhood of fetid discharges and noxious emanations.

Chalvet, of Paris, made a series of investigations into the salubrity of hospitals, and found, by a careful analysis, that the air in the wards of St Louis contained a considerable percentage of starch corpuscles; that a large quantity of putrescible matter was collected on the bed-curtains, on the walls and windows, etc.; also that the linen returned from the laundry was stained with organic detritus, linseed, and spots of various kinds. He also showed that water condensed in the neighbourhood of a suppurating focus is strongly charged with irregular corpuscles, resembling dried pus. Dust collected from the walls of St Louis (wards) furnished no less than 36 per cent. of organized matter.

Eiselt, of Prague, found small cells, resembling pus-corpuscles, spread through the air of a ward in which an epidemic of purulent ophthalmia was raging.

Reveil found that those cells floating in the air, and the debris of epithelial cells, become yellow on the application of nitric acid; also that pieces of charpie abounded in those corpuscles. The dust in his laboratory furnished 46 per cent. of organic matter.

Kallman found organic debris encrusted with a granular substance, which gave a reaction of copper, the dust having been collected in the ophthalmic hospital, where sulphate of copper was much used.

Thus, the researches of Chalvet, Eiselt, Reveil, and Kallman, prove that the atmosphere of the surgical wards of an hospital is largely impregnated with organic matter. What condition could be more favourable for the development of those morbid germs and ferments than the surface of a wound exposed unprotected to such atmospheres? On the theory of catalysis—that is, the introduction of a small quantity of virus, and the septic changes which take place in the blood to which it has gained access—we can readily understand how important it is to exclude the most minute portion of the air of a ward containing such a large percentage of organic matter. But we know that exclusion is unnecessary, provided the air be filtered or purified, thus rendering it innocuous.

Davaine showed that those low germs of life seriously affect the blood of the higher animals. He discovered Bacteria (probably including vibriones, etc., under the general term Bacterium) in the blood of malignant pustules, in the blood of *typhoid fever*, and in the blood of sheep which had suffered from splenic apoplexy.

Tigri and Signol corroborated the statements of Davaine.

The Effect of Noxious Emanations such as those evolved from Marshes, Cesspools, etc., on Fermentation and Putrefaction.—The theory that such affections as cholera, typhoid fever, smallpox, diphtheria, intermittent fever, etc., may be traced to what are termed "germs" generally, is by no means of recent date. It is a subject of the most vital importance, involving such questions as drainage, isolation, the use of antiseptics and disinfectants, and affects essentially the treatment of such diseases (preventive and curative). Dr Barker conducted the air of a cesspool, containing sulphuretted hydrogen and sulphide of ammonium, into a box in which animals were confined, and the symptoms which resulted resembled the minor forms of continued fever, common to the dirty and ill-ventilated houses of the lower classes. This he attributed to the gaseous matters. Now, I think that these symptoms resulted from the quantity of organic matter (low organisms and fungi) contained in such an atmosphere.

Dr D. Thomson recognised the importance of organic matter as a constituent of the air of towns, and held that the gases evolved during putrefaction are not the main source of danger.

Place a globe filled with ice over a cesspool, and in a short time the matter contained in the aqueous vapour will be condensed on its surface. The liquid will be turbid, have an offensive odour and alkaline reaction, and contain small flakes of matter, which, under the microscope, have the appearance of organic debris, and contain vibriones, monads, and other forms of low life, with fungoid filaments. A similar result may be obtained on placing a bell jar over putrid meat. Can we be surprised at fermentation and putrefaction being readily set up in such neighbourhoods?

Dr Salisbury says, that the spores of fungi are, at least, the vehicles by means of which the malaria-poison gains entrance into the human frame; that a disease analogous to measles, which occurred as an epidemic during the American war, arose from the prevalence of a fungus (*penicillium*). This he concluded from a large number of men arising with symptoms of measles, after sleeping on straw which was muddy and had a peculiar odour; and by inoculation with this fungus he set up in many persons, in from twenty-six to ninety-six hours, a disease closely resembling measles.

Dr Snow says, that although cholera is disseminated by a special cell, it offers no objection to the view that the structure of the cholera-poison cannot be recognised by the microscope; for the matters of smallpox and chancre can only be recognised by their effects, and not by their physical properties.

Dr Halford states, that when a person is bitten by the cobra, minute living germinal matters are thrown into the blood, which speedily grow into cells, and as rapidly multiply, so that in a few hours millions upon millions are produced.

Dr Kennedy, in 1863, relates the case of a disease, in all respects resembling measles, produced in a young lad who had some fusty linseed-meal thrown in his face, entering his eyes, nostrils, and mouth.

During the epidemic of malarious fever in the Mauritius, the presence of fungoid spores identical with cryptogams, found in the stagnant pools of Grande and Petite Rivière, occurred throughout all the mucous surfaces, and in most of the secretions, of patients labouring under the disease.

Dr Massy, in the Army Indian Reports, remarks, that in the dry season there was an unusual quantity of aerial spores of Mucor in Jaffera, where there was an increased prevalence and intensity of intermittent fever. He detected similar organisms in almost all the specimens of the drinking water of the island which he examined. He found them in the pus crusts and hairs taken from a form of ringworm (*frambœsia*). These ulcers are common among badly-nourished native children, and are now treated by the application of sulphurous acid. He detected a residue, consisting of torula spores, mycelia, and active vibriones, in the urine, perspiration, and fæces of patients suffering from malarious fever.

I have alluded to those researches of Halford, Kennedy, Massy, Salisbury, and Snow, to show how many forms of fever, etc., may be traced to the absorption of these low organisms and fungi.

Take typhoid or enteric fever — the pythogenic fever of Murson (πυθογενης, from πυθων, πυθομαι (putresco), γενναω). It generally arises in the neighbourhood of decomposing matter, cesspools, stagnant water, drains, etc.—in short, where putrefaction and fermentation are prevalent. It is not contagious, but is communicated by means of the alvine secretions, which doubtless contain the poison. It has been remarked that the stools of enteric fever are very prone to decomposition and fermentation; again, that it occurs most frequently in hot weather (favourable to putrefaction).

Now, that it is from the quantity (and, possibly, from the virulent character) of the organism and fungi contained in such atmospheres that typhoid fever owes its origin, is, I think, evident.

In connexion with this subject, I may here briefly refer to an experiment instituted to test the effect of an atmosphere emanating from fetid matter on a putrescible fluid.

A small basin, filled with very fetid matter (collected from jars containing frogs' legs and other preparations steeped in water, and which had been laid aside for several months, pus, blood, etc.), was placed on a ledge outside the laboratory window, Physiological Laboratory of the University. A Wolfian jar half filled with urine, fitted with two glass tubes, one bent over the basin and the other connected by elastic tubing with a Sprengle's air-pump, was placed beside the basin. A second Wolfian jar, similarly charged, was placed on a shelf in the laboratory. Then a small flask was also half-filled with a portion of the same urine, but boiled and plugged with carbolated wool, and placed beside the basin containing the fetid matter. The Sprengle pump was then started, and thus the air emanating from the matter was drawn over the urine. On examining this jar after the lapse of seven days, it presented the following appearance:—Colour, muddy yellow, thick white scum on surface; odour very fetid. *Microscopic Examination.*—Field literally crowded with organisms; numerous bacteria and other minute organisms. The jar placed in the laboratory presented the following characters:—Colour, muddy yellow, but not so marked as in the other jar; very thin scum on surface. *Microscopic Examination.*—Numbers of bacteria, and a few thin, short vibriones, of a dark colour, moving sluggishly. The contents of the flask plugged with cotton remained perfectly clear, and apparently unaltered; the plug had a very fetid smell, and was quite black with dust, etc.

The differences thus—as observed from the general appearance of the urine, the quantity and character of the organisms in the jar exposed to the fetid atmosphere—contrast forcibly with the contents of the laboratory jar, where decomposition was evidently in a much less advanced stage. The fact of the plugged flask remaining unaffected, shows that the gases evolved produced no bad effect, therefore it is clear that the exciting causes of putrefaction were filtered and retained by the meshes of the cotton.

Professor Lister, alluding to the noxious influences of the atmosphere, says,—"Grave results are induced by access of the atmosphere in compound fractures, etc. The decomposition of the blood effused among the interstices of the tissues, losing by putrefaction its naturally bland character, assumes the properties of an acrid irritant, occasioning both local and general disturbance."

The theory of fermentation and putrefaction, in its application to medicine and surgery, especially the latter, is not based on logical inference solely, but on the results of observations and experimental research. It is no longer a matter of conjecture that impure air, more especially air emanating from noxious sources, may account for the disastrous consequences so frequently met with in the crowded wards of a surgical hospital.

HOSPITALISM.

The Effect of the Antiseptic Treatment on Erysipelas, Hospital Gangrene, and Pyæmia.—The theory that pyæmia is due to some atmospheric influence is not of recent date.

Ambrose Paré (1582) first taught that secondary abscesses in surgical cases were due to a changed condition of the fluid produced by some unknown alteration in the atmosphere, and determining a purulent diathesis.

Solly considers that the presence of pyæmia at the present time is dependent on some occult atmospheric cause over which we have no control, and that the secondary suppurations are owing to purulent absorption.

Callandar remarks, that an animal or septic poison introduced into the system is the exciting cause of the primary disease—systemic infection. It is connected in some subtle manner with a vitiated condition of the blood. The blood undergoes decomposition, or passes into a state of fermentation.

Wilkes considers that pus or its elements, or germs, give rise to purulent deposits, as the cancer germs give rise to cancer.

Savory ascribes it to some putrid fluid poisoning the blood.

Wood supposes the alterations in the blood to be of a zymotic nature.

Polli ascribes to this morbid process a fermentative character.

Braidwood gives to pyæmia the term "suppurative fever," and states that it is not contagious, and, although sometimes prevalent, cannot be strictly spoken of as epidemic; in another part of his work, that "pus, as such, has nothing to do with inducing suppurative fever, nor do its liquid contents produce this condition; but it is probable that some catalytic process is excited by purulent fluids in contact with imperfectly oxygenized blood."

Polli, at the British Medical Association, 1867, remarked,—"It has long been admitted that there are diseases whose cause and origin is a specific ferment, either generated in the system or introduced from without."

Batailhé treats cases of pyæmia by dressing their wounds with alcoholic fluids, so as to prevent the putrefaction of the discharge, and to close the mouths of the open veins and lymphatics.

Savory remarks, in some very bad cases the blood is putrid at the time of death, judging from the odour and changes which the blood and soft tissues present by rapidly-advancing decomposition.

Castleman and Ducrest made experiments on animals, and came to the following conclusions:—1. That multiple abscesses are due to a changed condition of the blood, which is most frequently produced by the presence of a foreign principle in this fluid. 2. That when abscesses are developed in certain other diseases, the principle is that which gives rise to the disease itself. 3. That in those abscesses which are developed in the puerperal state after traumatic lesions, surgical operations, or phlebitis, the principle is pus. 4. That the progress, prognosis, and treatment of these abscesses entirely depend on the nature of the cause that has produced them.

Pyæmia is grouped in many surgical works with erysipelas, diffuse inflammation of the cellular tissues, and other inflammations of a low or sthenic type. Erysipelas, however, is contagious, whereas pyæmia is not.

The exciting cause of that surgical fever known as pyæmia has been a matter of dispute for hundreds of years. Some stated that it was due to an atmospheric influence, but did not, or rather could not, define it; others, again, that it was due to the absorption of decomposed matter; others that it was due to some ferment. Nothing definite, however, has ever been stated with regard to its etiology. Now, I think we may venture to hope that a solution of this hitherto inexplicable question is not far distant. That the antiseptic treatment has effectually driven pyæmia from the wards (where it has been faithfully carried out) is a matter of fact, the result of detailed statistics.

Mr Lister published, in a pamphlet in 1869, statistics taken from a period preceding and subsequent to the introduction of the antiseptic treatment, in which he showed that only two cases of pyæmia (the causes in both of which were accounted for) had occurred in his ward during the latter period. Again, in the *Lancet* of August 1870, he stated that no cases of pyæmia had occurred in his wards during the nine preceding months (that is, since his appointment to the Edinburgh Infirmary).

I remember, in 1866, in the clinical surgical wards, pyæmia, hospital gangrene, and erysipelas were all very prevalent. In Ward IV., there were, at the same time, two cases of pyæmia, two cases of hospital gangrene, and one of erysipelas. The two cases of hospital gangrene are particularly impressed on my memory, as I attended both of them subsequent to their removal from the hospital. In one case, a patient was admitted suffering from a small callous ulcer of the leg; and, as it was a typical case, he was taken in to lecture, where Mr Syme, after describing the case and explaining the treatment, remarked that in a very short time he would be quite well. That day week a small grayish spot appeared on the edge of the sore. It was immediately and thoroughly cauterized with strong nitric acid (the truth is, we were too well acquainted with these cases, and could diagnose them early), and poultices applied, but all to no purpose. It spread very rapidly, and at Mr Syme's recommendation he was removed to his own house. The gangrene ate nearly to the bone; and when at last the disease was arrested, a sore 6 by 4 inches remained. Gradually, however, he recovered, although for some time he appeared to be in a dying condition. The other case, in the same ward, was one of abscess of the head of the tibia, where, two days after the operation, the gray spot appeared, extending rapidly. He also was removed home (two miles to the west of Edinburgh). In this case, like the former, the disease was not arrested till several inches of the tibia was exposed. He eventually made a slow recovery, and was still an invalid when I last heard of him (two years later). Both the cases of pyæmia were fatal. In short, death from pyæmia was, alas! of too common occurrence.

During the last two and a half years, there has not been a single case of pyæmia. I have not seen or heard of any cases of hospital gangrene since the time referred to above. Two cases of superficial erysipelas, indeed, occurred in December 1869, both the result of sudden exposure to cold. One, an amputation above the knee, was taken, five days after the operation, to the theatre, and dressed at lecture. It was a bitterly cold, foggy morning (the gas had to be lit), and, shortly after, a slight erysipelatous blush appeared, which very soon subsided.

Do not these simple facts speak for themselves?

Thus, a relationship between pyæmia, hospital gangrene, and erysipelas (the dreaded scourges of our large hospitals) may be traced, from the fact of their disappearance coincident with the introduction of Antiseptic Surgery.

CLINICAL CASES.

TABLE I.—*Compound Fractures.*

	Name.	Ward.	Age.	No. of Case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
I. Compound Fractures resulting from *Indirect Violence*, as for instance—								
(*a.*) A simple converted in a compound fracture by the bone being thrust through the soft parts when carried to the hospital; particularly liable to occur in small oblique fractures, . . .	Thomas Pollock,	III.	5	1	Sept. 30, 1867	Compound fracture and wound of leg	Oct. 16, 1867	Recovered.
(*b.*) A patient falling or jumping from a height, and the fractured end thrust through the soft parts, ...	Name unknown,	Waiting Room	50	2	Sept. 27, 1869	Compound fracture of radius	Jan. 10, 1870	,,
	Ann Law,	III.	25	3	Nov. 18, 1867	Compound fracture of tibia and fibula	Dec. 31, 1867	,,
	John Smith,	V.	...	4	Feb. 29, 1868	Compound fracture of tibia and fibula	May 7, 1868	,,
II. Compound Fractures resulting from *Direct Violence*—								
(*a.*) Caused by a sharp instrument, .	...	...	...	...	...	......	...	...
(*b.*) Caused by the blow of a piece of metal attached to machinery in rapid motion, or by the blow of a windlass, .	James Cowie,	V.	35	5	Dec. 27, 1869	Compound comminuted fracture of tibia	Feb. 1870	,,
	James Geehone,	V.	30	6	July 4, 1868	Compound fracture of humerus, radius, and ulna	Oct. 3, 1868	,,
	Albert Tronskasski,	V.	18	7	Aug. 10, 1865	Compound fracture of humerus	Sept. 20, 1865	,,
(*c.*) Caused by a weight falling on the limb, as a stone or loose debris, . .	David Johnstone,	VI.	23	8	June 26, 1869	Compound comminuted fracture of tibia and fibula	Sept. 14, 1869	,,
	James Cupples,	II. P.	17	9	July 30, 1869	Comp. fracture of lower jaw	Sept. 11, 1869	,,
	Edward Sweenie,	VI.	16	10	June 27, 1869	Compound fracture of tibia and fibula	Aug. 19, 1869	,,
(*d.*) Caused by a lorry or cart wheel, or railway truck, passing over the limb, ...	Thomas Howard,	IV.	40	11	Nov. 22, 1869	Compound fracture of tibia and fibula	Jan. 1870	,,
	Name unknown,	Waiting Room	11	12	Dec. 23, 1869	Compound fracture of radius and ulna	Feb. 1870	,,

CLINICAL CASES.

TABLE II.—*Abscesses.*

		Name.	Ward.	Age.	No. of Case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
Acute.	Circumscribed.	Thomas Graham,	R.W.B.	23	13	Oct. 18, 1869	Acute circumscribed abscess (post auricular)	Oct. 27, 1869	Recovered.
		John Gardiner,	R.W.B.	54	14	Nov. 29, 1869	Abscess on forehead	Dec. 7, 1869	,,
		Hector Park,	III.	6	17	Dec. 18, 1869	Abscess on occipital region	Jan. 3, 1870	,,
		Jane Beattie,	III.	23	18	Dec. 29, 1869	Abscess, sub-maxillary	Jan. 4, 1870	,,
		Eliza Wilson,	III.	6	19	Jan. 4, 1870	Abscess, post scapular	Jan. 14, 1870	,,
		Walter Stewart,	III.	5	20	Aug. 3, 1869	Periosteal abscess of tibia	Sept. 10, 1869	,,
		Mary Macdonald,	III.	11	23	Nov. 26, 1868	Acute periostitis of tibia	Dec. 26, 1868	,,
		Mary Mackay,	II.	25	29	April 18, 1868	Abscess, axillary	May 2, 1868	,,
	Diffuse.	William Nelson,	V.	36	15	Dec. 24, 1869	Diffuse abscess of thigh	Jan. 8, 1870	,,
		Jemima Collins,	III.	27	21	June 8, 1868	,, ,, of ,,	July 6, 1868	,,
		James Jack,	IV. P.	44	22	Sept. 1, 1868	,, ,, beneath scalp	Sept. 21, 1868	,,
		Thomas Dawson,	VI.	59	26	Dec. 4, 1867	,, ,, of forearm	Dec. 12, 1867	,,
	Infiltrated.	Andrew Ramsay,	R.W.B.	...	27	Feb. 24, 1868	Infiltrated abscess of thigh	March 2, 1868	,,
Chronic..................		Mary Mackie,	III.	5	16	Nov. 29, 1869	Chronic abscess of leg	Dec. 14, 1869	,,
		Jessie Kay,	I.	8	24	Sept. 6, 1869	,, ,, of cheek	Oct. 2, 1869	,,
		Christina Allen,	II.	25	25	Dec. 1, 1867	,, ,, of mamma	Dec. 9, 1867	,,
		Alexander Black,	IV.	...	28	March 14, 1868	,, ,, of side	March 14, 1868	,,
Lumbar abscess.		William M'Farlane,	III.	6	30	Sept. 12, 1867	Lumbar abscess	Nov. 18, 1867	,,
Psoas abscesses.		William Helbert,	IV.	47	31	Oct. 28, 1867	Psoas ,,	Dec. 17, 1867	,,
		No name,	Glasgow	27	32	Jan. 22, 1870	,, ,,	Feb. 5, 1871	,,
		No name,	Glasgow	25	33	July 27, 1867	,, ,,	Aug. 1867	,,
		No name,	Glasgow	...	34	June 1867	,, ,,	July 1867	,,
Abscess connected with carious bone.		No name,	Glasgow	...	37	Sept. 1867	Abscess of elbow connected with caries	Nov. 1867	,,

CLINICAL CASES.

TABLE III.—*Affections of Joints.*

	Name.	No. of Ward.	Age.	Date of Admission.	Disease.	Date of Dismissal.	Event.
I. Acute Bursitis,	Mich. Benson,	IV. P.	40	Aug. 8, 1869	Acute bursitis of elbow	Aug. 14, 1869	Recov'd.
II. Chronic Bursitis,	Margt. Mackay,	II.	16	Oct. 9, 1869	Chronic bursitis of knee	Oct. 27, 1869	„
	Edward Jones,	VI.	45	Jan. 16, 1868	Thickening of the bursa patellæ	Feb. 18, 1869	„
III. Bursal Swelling,	Name unknown	Glasgow	...	Aug. 8, 1869	Bursal swelling of the palm of hand and wrist	Sept. 2, 1869	„
IV. Loose Cartilages in Joints,	Name unknown	Glasgow	...	June 28, 1868	Loose cartilage in knee-joints	July 1868	„
V. Synovitis,	Name unknown	L'pool	...	Apr. 14, 1869	Suppurative synovitis of the knee-joint	May 28, 1869	„
	Name unknown	London	...	June 22, 1868	Acute synovitis of the knee-joint	July 1, 1868	„
	Name unknown	L'pool	...	Nov. 30, 1868	Suppuration of knee-joint	Dec. 1868	„
VI. Wounds of Joints,	James Dunbar,	R. W. B.	52	Aug. 10, 1867	Wound of knee-joint	Sept. 13, 1867	„
	Name unknown	Waiting Room	...	......	Fracture of metacarpal bone and wound of thumb	......	„

TABLE IV.—*Compound Dislocations.*

Name.	Ward.	Age.	No. of Case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
No name,	IV.	...	56	Feb. 1870	Compound dislocation of the ankle	Mar. 1870	Recov'd.
No name,	...	...	57	......	„ „ „	......	„
No name,	Glasgow	...	58	......	„ „ „	......	„
No name,	Glasgow	60	59	......	„ „ „	......	„
No name,	Glasgow	...	60	......	„ „ „	......	„

TABLE V.—*Burns and Scalds.*

Name.	Ward.	Age.	No. of Case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
J. Renwick,	IV. P.	33	66	Dec. 17, 1869	Burns of face, chest, and arms	Jan. 15, 1870	Recov'd.
No name,	Aberd'n	...	67	Nov. 1869	Burn of chest	Nov. 1869	„
No name,	...	...	68	......	Severe scald of forearm	......	„
No name,	...	...	69	......	Scald of breast and shoulder	......	„
W. Burnett,	IV. P.	24	70	Oct. 28, 1870	Burn of lower extremities	Jan. 30, 1871	„
Ann Gibson,	III.	36	71	Dec. 23, 1870	Burn of thighs, etc.	Feb. 1871	„

TABLE VI.—*Tumours of Mamma.*

Name.	Ward.	Age.	No. of case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
Jane Malcolm,	II.	58	48	Jan. 17, 1871	Scirrhus of mamma	Feb. 1871	Recov'd.
Janet Square,	I.	26	47	Aug. 30, 1869	Adenoid tumour of right mamma	Sept. 17, 1869	,,
A. M'Naughton,	II.	38	50	Nov. 9, 1870	Scirrhus of mamma	Jan. 5, 1871	,,
M. M'Bain,	II.	64	51	Jan. 9, 1871	Scirrhus of mamma	Feb. 1871	,,
Eliz. Dick,	II.	68	52	Jan. 30, 1871	Recurrent scirrhus in cicatrix of mamma	Feb. 18, 1871	,,

TABLE VII.—*Tumours of the Superior Maxilla.*

Name.	Ward.	Age.	No. of case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
Jessie Scott,	II.	35	62	Aug. 9, 1868	Tumour of superior maxilla	Aug. 29, 1868	Recov'd.
Sarah M'Ilroy,	II.	40	63	Dec. 1, 1870	Malignant epulis of superior maxilla	Jan. 30, 1871	,,
Tumours of Inferior Maxilla.							
Ann M'Gee,	II.	31	64	Jan. 21, 1871	Myeloid tumour of inferior maxilla	Feb. 1871	Recov'd.
No name,	Glasgow	...	65	Feb. 1869	Encephaloid tumour of inferior maxilla	Mar. 1869	,,

TABLE VIII.—*Ligature of Arteries.*

Name.	Ward.	Age.	No. of case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
No name,	...	...	72	Jan. 1868	Aneurism of femoral artery	Feb. 1868	Recov'd.
Alex. Brown,	IV.	47	74	July 27, 1870	Diffuse popliteal aneurism	Sep. 1870	,,
No name,	Liverp'l	...	75	Mar. 1869	Aneurism of carotid	Mar. 1869	,,
No name,	...	...	76	Nov. 1868	Ligature of the left common carotid	Dec. 1868	,,

TABLE IX.—*Miscellaneous Cases.*

Name.	Ward.	Age.	No. of case.	Date of Admission.	Disease.	Date of Dismissal.	Event.
Alex. Young,	V.	8	38	Oct. 28, 1868	Necrosis of tibia	Nov. 14, 1868	Recov'd.
No name,	...	...	36	...	Necrosis of frontal bone	...	,,
Thomas Perkin,	R.W.B.	30	55	Sept. 9, 1870	Lacerated wound of thumb	Oct. 22, 1870	,,
Robert Bayne,	IV.	18	61	Dec. 7, 1870	Badly united fracture of ulna, and dislocation of radius	Jan. 1871	,,

Fig. 1

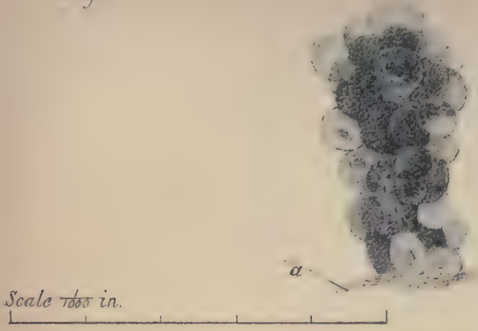


Fig. 2

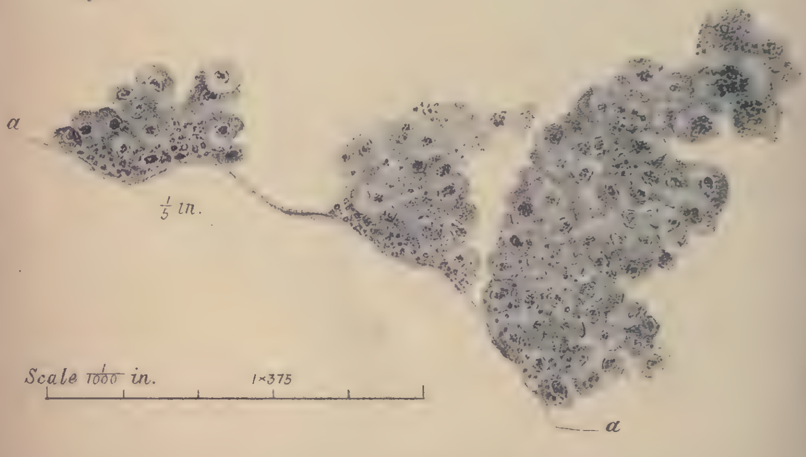
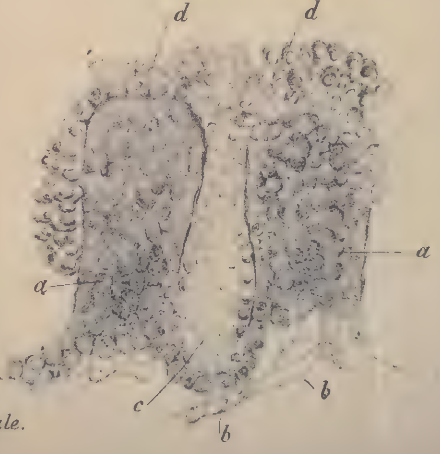
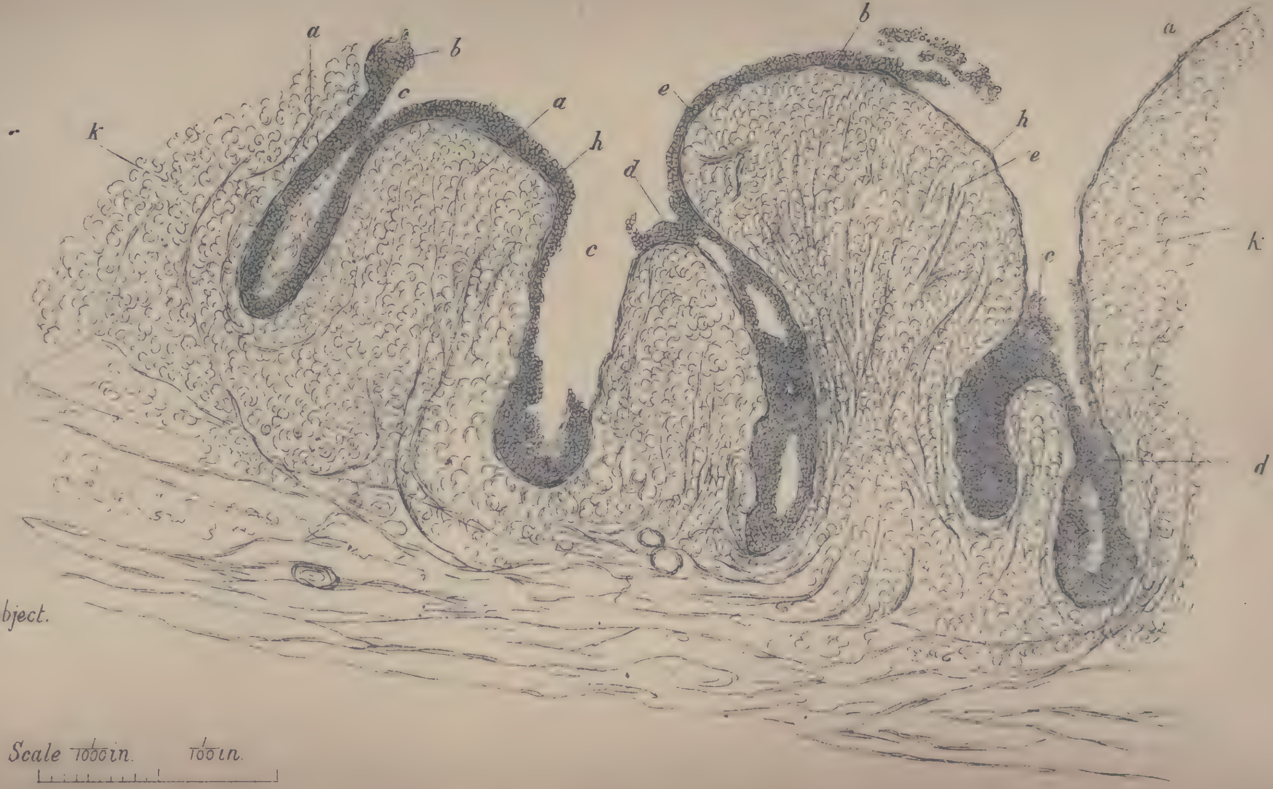


Fig. 3



$\frac{1}{5}$ inch object.
Not drawn to exact scale.
Rather reduced.

PLATE II



1inch object.

PLATE IV

Fig. 1

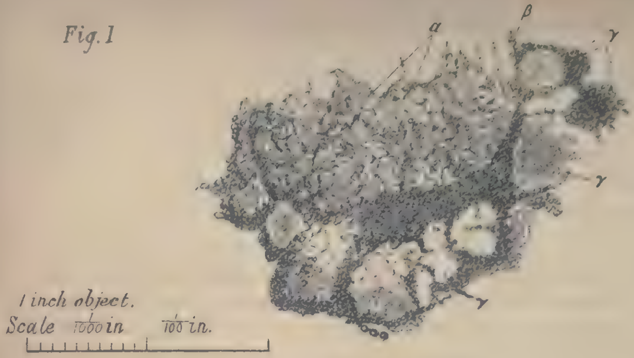


Fig. 2

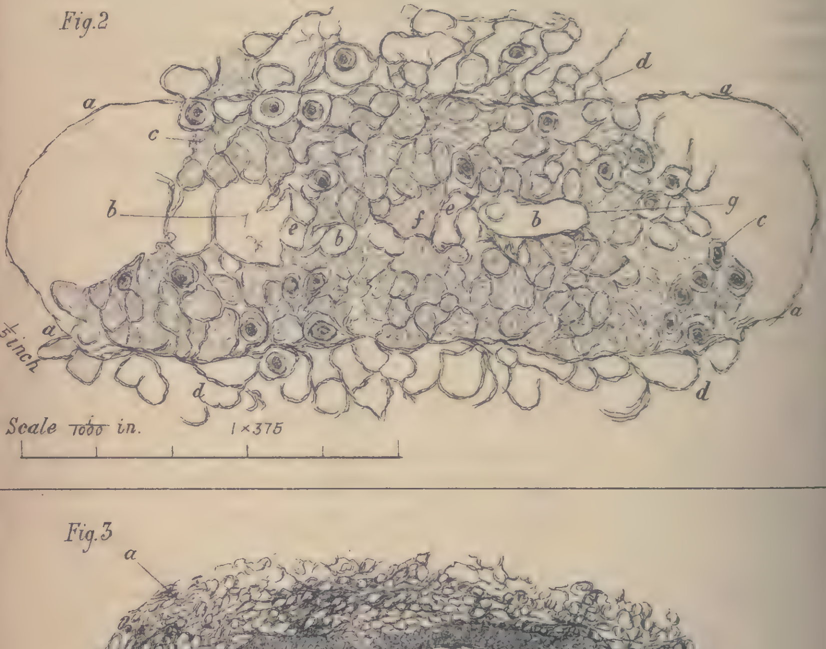
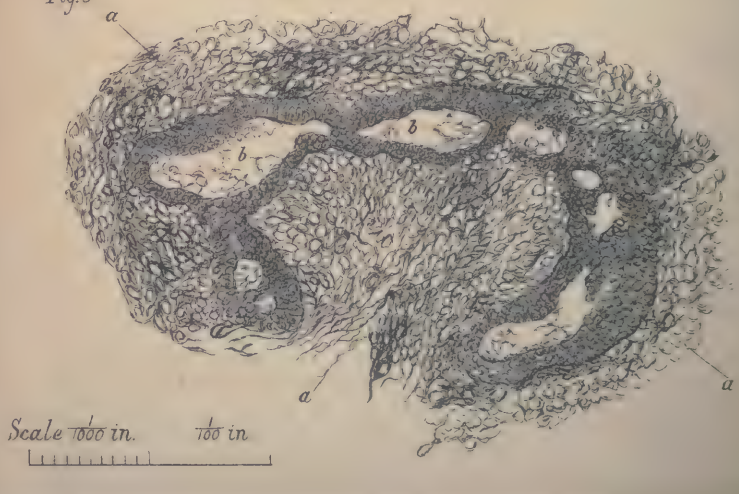


Fig. 3



[illegible] Goodhart del.

ARTICLE V.—*On the Nature and Development of Cystic Tumours of the Breast.* By JAMES F. GOODHART, M.B. Aberd., etc.; Pathological Assistant in the Hunterian Museum of the Royal College of Surgeons of England.

(*Read at a Meeting of the Sussex Medico-Chirurgical Society at Brighton, 1st February* 1872.)

IN many, if not in most, of our pathological collections, tumours of the breast, other than scirrhus, whether wholly solid, partly cystic, or cystic with endogenous dendritic growths, are, with few exceptions, catalogued under the heading Adenocele, or under one of the numerous equivalent titles suggested for it, such as chronic mammary tumour, and with which it is synonymous. One would infer from this that these tumours are a matter of almost everyday occurrence, and that they must constitute by far the larger proportion of what are usually accepted as innocent growths about the mamma.

DESCRIPTION OF PLATES.

PLATE I.—Figs. 1 and 2.—Papules from the wall of an intra-cystic growth in the breast.

The large rounded cells are shown with a large single nucleus.

a, a. Flattened cells of wall. No connective of any kind could be detected in these growths. Fresh specimen. Camera, 1 × 375.

Fig. 3.—Papules from an intra-cystic growth in the breast.

a, a. Two papules formed of rounded cells with distinct nucleus.
b, b. Cells have escaped, leaving stroma only of delicate fibrillæ.
c. Follicle formed between the two papules.
d, d. Cells heaping up on the surface. Fresh specimen. 1 × 375 Camera reduced.

PLATE II.—Section of wall from cystic breast.

a, a, a. Large papules formed by (?) gradual fusion of many smaller ones.
b, b. Epithelium.
c, c. Follicles formed by an approximation of the papules.
d, d. Cysts forming by an obliteration of the mouth of the follicle.
e, e. Small vessels cut across.
h, h. Membrana limitans, as plainly seen under 1 inch objective.
k. Stroma of connective, not filled in. Chromic acid prep. 1 inch objects.

PLATE III.—Fig. 1.—Section of tertiary papilla, from cystic disease of breast.

a, a. Stroma of papilla as seen under a low power. Its centre contained numerous cavities, and was much more rarified than the circumference.
β. Agglomeration of cells to form pseudo-limiting membrane upon which other papillæ, *γ, γ, γ,* have formed, and are already becoming converted into cysts.

Fig. 2. "Kyste lacunaire," formed by papillæ now fused above.

a, a. Elongated cells and connective, arranged in a linear manner, showing the external limit of the original papilla.
g. Limit of epithelium.
b, b. Cyst cavity.
c, c, c. Epithelium, composed of rounded cells, each of which is surrounded by a ring of connective fibres.
d, d. Connective of the papilla proper, showing it directly continuous with that running into the epithelial layer.
e, e. Extension of threads across the cyst cavity, showing how this is obliterated and a solid growth formed.
f. Perfect obliteration of cyst cavity. Chromic acid prep. Camera, 1 × 375.

Fig. 3. Lacunar cyst, forming secondary cysts by adhesion of its walls.

a, a. Stroma beneath epithelial lining.
b, b. Cysts formed in it.

Such an inference would, however, hardly be in accord with most recent pathological opinion and observation, which would seem to indicate that adenoid growths in the breast are an insignificant minority compared with sarcomatous, fibromatous, and myxomatous tumours, more especially the first of the three, which are much more common. I do not propose to quarrel with this distinction on the whole, founded, as it probably is, upon the examination of large numbers of cases; on the contrary, I believe it to be strictly correct, but only so far as the bare histology of the tumours carries us. No doubt, many of the growths examined in the breast are formed of young tissue, which, not so very long ago, would have been called fibro-cellular. But now, they have arrived at a further stage of vocabular differentiation, and are split up according to consistence, shape of cell element, and character of connective, into the various groups just named. A classification such as this, however, while adding a certain correctness of detail, is hardly an unmixed good, since it separates from each other growths which have at any rate certain rough features in common, and which, as far as their *true* nature is concerned, are probably not placed far outside their proper confines when looked upon in the light in which they have long been regarded as adenoceles.

The discussion of this subject thus embraces, it will be seen, two perfectly distinct questions, the microscopical characters of certain structures, and their proper position in any system of classification; in other words, their composition and nature. The former, simply one of fact, is easily decided by the examination of specimens; while the settlement of the latter can only be arrived at by inference after the consideration of their mode of development.

In regarding many of these tumours of the breast as glandular, I would not be understood to say that they are all formed of racemose gland structure; the term is applied here, as it is in our museums, to tumours having a foliated arrangement of their tissues, and which, in by far the greater number of instances, have cysts throughout them or in some part of their substance. The name "adenocele," thus interpreted, will include two histologically different forms of growth, the one tubular, like unto the breast itself, and the other made up of distinct acini in small proportion—which, indeed, may not be present at all—and in greater part of embryo gland-cells lying in the meshes of a delicate connective tissue; a growth, in fact, which, in strict pathological language, more nearly resembles the large round-celled sarcomata, Plate III. Fig. 2. Many cases, no doubt, are really made up of sarcomatous elements, and I only class the two forms together as practically one disease, from the study of their mode of production, which leads me to think that both are evolved in a similar manner. For this reason I shall venture here to describe them in common.

This distinction conceded, I have no hesitation in saying that tubular gland growth in the breast is decidedly rare, and what are often loosely called sections of tubes are not so at all, but are really sections of cysts in a young gland tumour, and the mode of formation of which I shall attempt to describe immediately. Whether these cysts be not an abortive formation of tubes and true breast tissue is another question—very probably they are.

I need not dwell long on the *rough* characters of these adenoceles; it will be sufficient to recall to mind, what is already well known to all who are familiar with pathological preparations, that a very large proportion of them are cystic; that all have a peculiar foliated or arborescent arrangement—said to be due to the clustering of cæcal acini round a main tube—and that nearly all when fresh are largely colloidal in their nature.

Their almost constant association with cysts is a point which will be dwelt upon hereafter in relation to their *raison d'être.* Of the small group uncomplicated with cysts—comprising the true adenoceles of recent authors—it may be said that the involuted type of the cystic form is still present in most of them, and I therefore think it fair to infer that the absence of cysts is in reality due to their obliteration by growth, or apposition of their surfaces through absence of secretion, rather than to the formation of tumour quite apart from cyst.

Starting now on the investigation of the minute structure of these growths, a primary or parent cyst may be, of course, formed in the gland by many modes, most commonly, however, we may suppose, by the blocking up of a duct and the formation of a retention cyst. Any one of the tubules of the gland may thus easily form a parent cyst which becomes filled with secretion. An examination of this shows it to be nearly always viscid and mucoid in its character, and composed in great part of fattily degenerating rounded cells, containing, if not obscured or broken up by granular changes, a single large nucleus.

If the wall of the cyst be examined, it will, even to the unaided eye, often appear velvety in look, sometimes all over, at others only in patches. A thin section made vertical to the surface of the cavity at one of these spots, and examined microscopically, shows a cellular lining attached to the parent wall, irregularly proliferating and heaping up into papillæ, at first of every variety of shape, but ultimately of very regularly truncated ovoid form. Some of these appearances are shown in Plate I., Figs. 1, 2, 3, and Plate II., and the papillæ may, in many cases, be perfectly well seen by the naked eye.

The epithelium of the walls of the cyst puts on every variety of form. It may be columnar or tesselated, or both together, the latter condition being very common; in which case the superficial cells are generally columnar, while the deeper ones are rounded. The most frequent of all, however, is the shape depicted in Plate I., Figs. 1, 2, 3. In rare cases, ciliated epithelium is found on the walls of the cyst. It is difficult to say what, if any, are the varieties of condition which determine this difference in form; I am almost disposed to think that it is in great measure dependent on pressure, amount of secretion, or closeness of connexion between neighbouring cells.

Pari passu with this heaping up of epithelium, delicate thread-like filaments shoot out from the wall of the cyst, and gland tissue beneath, between the cells on the surface. Thus, as the papule grows, it forms a connected whole, and this is further soon strengthened by the projection into it of a capillary loop from beneath. A rounding off of the papule appears to come about by the gradual flattening and elongation of the outermost cells, or those farthest from the original growth. Under a low power (1 inch), a very distinct limiting membrane is apparently present, but under higher objectives this cannot be made out, except in rare cases, and no obvious distinction can be detected between the outside compressed cells and the central well-shaped ones; moreover, in the majority of instances, the former do not form a continuous layer, but gaps are found all along at irregular intervals. However, membrane or no membrane, each papule becomes distinctly limited in its regularity of form by some restrictions, and its external boundary then allows of a secondary growth taking place from its surface, just as the papilla we have traced thus far did from the wall of the primary cyst or tube. This process may take place a second, a third, and, for ought I know or see reason for doubting, any number of times. Plate III., Fig. 1 is taken from a papilla in which this process had gone on for four generations. As also no distinct separation exists between the cells of the centre of each papilla and those of its circumference, so in like manner, as soon as the cells again heap up on its surface can no separation be defined between the new tissue and that of the parent wall on which it formed. A thin section of a growth at this stage shows a series of papules covered with epithelium, and forming follicles between them, such as is shown in Plate II.

Now, it is obvious that if these small masses of cells protrude evenly all over a cyst whose cavity is small, the papules may so press upon each other that a solid growth will result; other conditions will also tend to ensure this, such as an absence of secreting properties on the part of the cells, and a tight capsule, which would hinder the cyst from expanding. Moreover, the pressure to which the whole new growth is subjected would naturally be unfavourable to the surface-growth of new cells, and therefore, in many of these small solid (or true?) adenoceles, we have a true limiting membrane formed; according to others, this is the containing membrane of a gland acinus. This, however, is not a very frequent termination, the solid growths being in very small proportion; two other processes are, of the three, much the more probable. Of these, one will still produce a solid growth, the other a cystic one; the solid form is, however, truly a cystic one, and only becomes solid after the production of the cavities. In both cases, neighbouring papillæ, lined all round their exterior with gland-cells or epithelium, meet at one spot (Plate II., *d*, *d*). By their union, a space is formed with its walls, covered by cells, endued with the power of secretion. This cavity may now go on to one of three terminations: (1.) If it be small, the gland-cells may join across between the opposing surfaces and form, to all intents and purposes, a gland acinus, many of which, if they occurred, would cause the solidity of growth just now mentioned; (2.) If of fair size, papillæ of epithelium may again form in its interior on the type of its own formation, and thus give rise to fresh follicular pits and cysts, to growth within an intra-cystic growth; or, (3.) The epithelium may become fatty, and simply die off into the interior, and form much of the mucoid fluid, so commonly present in this class of tumours. These facts are, I think, a sufficient explanation of the difference between the solid and the cystic forms.

But there are other varieties of development which also require a notice. A cyst of good size having formed by the approximation of neighbouring papillæ, its walls may become pouched-in at various places towards its own cavity, by pressure of other growths and cysts outside it. In this way, many follicles are formed inside a single cyst, and these, by union of opposite walls and angles, may divide one large cavity into three, four, or five smaller ones, all still lined with cells, and able either to secrete or to grow. These are the "kystes lacunaires" of Continental authorities (Plate III., Fig. 3); and they present an appearance, when perfectly subdivided, not unlike the sections of tubes before mentioned.

Lastly, we have cysts formed by a process of softening within a papilla, the central part of which disappears, the walls becoming lined with epithelium like other cysts. Part of this process is shown in Plate III., Fig. 1; but it is, I think, better studied not in the breast but in allied tumours of the testicle, such as glandular enchondromata—if one may be allowed to use such a term. In these, the cartilaginous papules, almost as soon as formed, undergo this change, the cartilage cells first disappearing when the matrix becomes discoloured, and faintly fibrous in texture, and ultimately softened down by fatty changes; lastly, the cavity thus produced is lined by tesselated or columnar epithelium.

Now, there can be no doubt, I think, that the tumours here all described as glandular, would be set down by others as varying in their nature, if judged alone by their histological elements. MM. Cornil and Ranvier are most explicit in their statement that the adenomata "do not contain lacunar cysts, so that their presence, far from characterizing adenoma, completely excludes it."[1] They say that where these exist, solid growths outside have pouched into a *duct*, of which the epithelium undergoes proliferation, and the duct then dilates.

My reasons for dissenting from their interpretation of the facts are, that the epithelium in the spaces is not an ordinary duct epithelium regularly arranged; and that, in place of being separated off by a basement membrane, as it would be from a growth pushing the duct before it, it cannot be distinguished from subjacent layers, or by any very distinct characteristics, from the very centre of what would be, according to their view, the growth proper; further, that this very duct epithelium, if so it be, becomes speedily incorporated with the tissues beneath, by the shooting up into the layer of delicate filaments of connective.

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[1] Manuel d'Histologie Pathologique, p. 292.

In the fibrous and other forms these changes are difficult of recognition, and unless the specimen be perfectly fresh, it is impossible to make out much of the real nature of these growths. The hardening process to which they are submitted renders the surface-cells of the papules granular, and detaches them from the parent mass, which then appears as a naked papilla, with here and there fatty-looking debris attached to it. It may, however, even at this time, be seen that the most external part of the mass is more homogeneous, and formed of younger tissue, than that of its base; in some cases, where an apparently distinct basement membrane exists, this is stained more deeply by reagents than the rest of the papule, indicating rather that it is not a part of a primarily-formed and involuted membrane, but that it is younger in point of time than the subjacent tissues.

The papules here described have been, as has been said, very generally looked upon as follicles lined with epithelium. This is probably not a correct view of their nature, since a network of connective runs through them, and capillary loops ramify within and not over them. All things considered, therefore, I prefer to say that they are surface-growths, whose stroma is formed, perhaps round the capillaries, from the centre of each papilla towards its circumference, and that the lacunar cysts are in many cases certainly not dilated ducts, but are newly formed cysts, produced in the way that has just been described. From this it will be seen that any attempt at gland-growth is outside any pre-existing tissue, or rather is always on the free surface of older growths, whether this be truly outside such previous formation or upon the surface of a space within it. Repeating once again, that no matter what the nature of the growth, all are formed on the same plan by the development of papules, and all has been said that need be said on the mode of production of these tumours.

In the next place, it will be well to strengthen the position just taken up by referring to what has been made out in cystic disease of the ovary, in which organ many of the growths are, as is now well known, produced by the same heaping up of cells from the wall of a cavity, by the same production of papules covered by epithelium or glandular cells, and by the ultimate union of these papules to form cysts.

The same stages obtain in the case of the ovary as in that of the breast; but for fuller information as to this point in ovarian pathology, the reader is referred to a paper in the Medico-Chirurgical Transactions of 1864, by Dr Wilson Fox, who first showed the true nature of such growths. Dr Braxton Hicks also, towards the close of 1864 (Guy's Hospital Reports), pointed out the similarity which exists between ovary and breast in regard to growth. Dr Hicks, however, describes the papules found in the ovary as all becoming follicular by a softening down in their centres, and compares their development with that of adenocele, which, he says, is known to be formed in the same way. Herein, then, I differ from him in saying that, in the majority of cases, the follicles of the latter are not formed inside the papilla, but outside it, by the help of others; inside it the vessels run, and the septa of the growth are formed.

If, then, these cystic tumours in the ovary are glandular, as many of them are allowed to be, it is hard to see why the presence of cysts in the breast should preclude the possibility of the presence of gland structure, as MM. Cornil and Ranvier would have us believe.

Analogous formations are also met with in the lip, scalp, intestine, and some nasal polypi, as described by Billroth. Except in the latter case, it is also important to note that the tumours are usually solid and not cystic: the bearing of this upon the question of growth will be touched upon again shortly.

Now, in all these regions, one constant condition exists in the presence of cavities or tubes of gland structure. What, then, is the relation between tube and cyst, and what that between cyst and growth? Taking the latter part of the question first, we may refer to the fact, that one of the greatest obstacles to growth is continuous pressure; we may then not unfairly infer the exact converse of this, and say that one of the greatest incitements to growth is the existence of space in which to grow. This, indeed, is a physiological axiom, which hardly needs to be stated. Every one has noticed the behaviour of granulations on a free surface, or that of new growth towards natural cavities, such as the bladder or vagina. Surely the unrestrictedness of these is due to their freedom from surrounding hindrances; and though such instances can only be adduced as evidence of unlimited extension when once the process has commenced, still, what is favourable to a colony as a whole, must be favourable to a majority of the individnal units; and therefore it may be argued that cysts, constant as I believe them to be in the earlier stages of these tumours, act as incitements to growth. The fact that they always occur about gland tubes suggests how the space which is necessary is obtained. One can hardly imagine any condition more likely to be constantly affording temporary or permanent occlusions of ducts, and therefore cysts, than the ramifications of tubular glands and their terminal cæca. Mr Birkett[1] gives details of one case in which a dilated duct was traced, and a growth found on its wall. This, however, can rarely be done; and I have never seen this the first step, though, from the investigation of the later stages, I have no doubt of its occurrence. It is not, however, necessary for the argument that a duct should first become dilated, because any cyst, whether formed by or independently of a tube, if in the neighbourhood of gland, is likely to become lined with epithelium and take on a pseudo-secretive action, and so to produce growth; but, in saying this, I rather anticipate what follows.

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[1] Guy's Hospital Reports, 1855. Art. "Adenocele."

In thus thinking that there is a causal relation between space and growth, I differ from Dr Hicks, who, in the paper before mentioned, argues that, inasmuch as all such growths are not cystic, therefore the cysts cannot be an essential element with them, and probably the two are only accidentally associated. But I have already shown how, a primary cyst being formed allowing of growth, it may be quite possible to get this obliterated without the production of fresh spaces containing fluid. I have now only further to say, that these tumours are much more unlimited in organs such as the breast and ovary, where there is a presence of conditions which ensure secretion, and therefore the distension of any cysts that may be formed—and, as a consequence, where freedom of growth is allowed—than in those glands, such as the sebaceous, whose secretion is more inspissated, and which is not so well adapted for distending without obliterating an obstructed duct.

In saying thus much of the relation which possibly exists between cysts and new growths, any conception of the first beginnings of tumour has been carefully avoided. It would indeed be fatal to the extension and main purport of this short paper, if we were to carry away the idea that any conditions before mentioned could be of themselves sufficient to produce new growth; they are, after all, only extrinsic adjuvants, and hardly touch the question as to why it should originate. It is not that there is a space ready in which cell-proliferation may take place; something must be behind and within each cell, fitting it to take advantage of conditions ready to its hand—and as to the nature of this something, we now pass on to say a word.

First of all, then, the mere fact of the presence of gland implies, one may say, under favourable conditions, the probability of growth, in that glands are largely formed of embryo cells, which are somewhat removed from the restrictive developmental influence brought to bear upon other parts where new tissues are interwoven with the old.

Let me explain:—In an ordinary fibrous tissue, let us say, nuclei of young material, or engaged in forming young tissue, are scattered here and there, completely surrounded by more formed substances. These young germs are therefore naturally thrown, so to speak, into good society, and, in somewhat homely language, may be said to be well brought up. This is hardly so in a gland, where a number of germinal elements are thrown together, and are not so overpowered by the tissue around as to forbid an independent action. What wonder, then, if at times they act out of harmony with the parent stock, and live a life of their own? Thus much may be said of any gland, but I take it that there are additional reasons in the case of one such as we are now more especially concerned with. In this case, they are subject to periodical excitements—to times when they are, we may suppose, supplied with increased nutriment and augmented force, which, if it be not supplied with an outlet, will likely enough lead to mischief from a clinical point of view, and this mischief will, as I think, probably be new growth. Why this should be so is, in a measure at any rate, explained by a hypothesis which the development of these tumours warrants us in making, viz., *that growth and secretion are to be looked upon merely as a common force finding its expression in different ways.*

In the early history of gland life, the force which the part has supplied to it, in common with the other regions of the body, is registered in growth and development. At a particular period, again, in its existence,—partly, no doubt, owing to calls that are made upon it, and partly also to a tendency long inherited to take on a definite action at a definite time,—the gland leaves off growth and takes on the capability of secretion, and thus is provided an outlet for its energy. Supposing now that, in the full tide of this developmental activity and high nutrition, a part of its secreting surface becomes shut off, or knocked and excited when its dormant power and longing cannot find equilibrium in secretion, what more likely—if, indeed, it be not just what we should expect—than that it should go back to its prior formative processes, and commence again to grow? Is not this physiologically sound? At any rate, presumptive evidence in its favour is afforded by the fact that these tumours are most common in young unmarried or sterile women; in other words, in those in whom secretion is in a state of nascent activity. Give this no outlet, and new growth will very possibly result, but, more than this, growth of such a kind as shall be a fair index of developmental tone, and of an otherwise healthy state, viz., a fair substitution for healthy gland structure. The representation will not be a perfect one, because it is not now as it was prior to the time when the gland first became able to secrete, when with undivided aims it was wholly occupied in development; now it is partly occupied in forming gland and partly in holding itself in readiness for secretive action, and the developmental process, at any rate, is not furthered by this subdivision of labour.

Diverging for a moment from the limits imposed upon our subject by its title, let us carry this idea of correlation to the other pole of gland life, and work it out to its conclusion. We shall then be on the wane of gland activity, a period when secretion is somewhat rudely stopped, often after having been in active use for years. The organ still has to dispose of force, all the more, probably, in that it has become accustomed to action, and for which reason a large amount of blood still reaches it, and now, while the mould is still present, giving its rough characters to the mass, a something is wanting—developmental *tone*, as we in our ignorance have ventured to call it—which in earlier days might probably have sent it on its way as a simple glandular tumour: a feeble copy of the original is present, it is true, but the idea and spirit of the master-hand are absent. Now there is no cohesion between the constituent elements; there is an individual as opposed to an inter-dependent life, and each cell lives through its stages absorbed in its own immediate ends, influencing rather than influenced by the still healthy structures, and quite regardless of the wants or interests of the organism on which, like a parasite, it may be said to feed.

Still, physiologically, this abnormal growth is an outlet for force, and the correlative of former service. As such, it must be looked upon as a most unhappy attempt, as far as we can see, to remedy an evil.

Various objections to the theory of correlation between growth and secretion have been made, two of which it will be well just to notice here. 1*st*, It is said that were the hypothesis a true one, many women at the end of the period of lactation would become the subjects of adenoceles, whereas the very opposite is notoriously the case. I cannot, however, think that this conclusion is a sound one; for, in the first place, at the termination of a long period of action, the gland itself may be said to be exhausted. In the second place, the whole amount of force throughout the system is obviously reduced, and every tissue in the body is making equal, if not greater, demands upon the common pabulum, from which alone the organ in question can derive its energy; while it may not unreasonably be supposed, that, by the time the whole body has regained its wonted status, the breast has returned to its state of nascent activity, in great measure habitual to it—to a state of *action*, in reality made manifest by its very quiescence.

2*d*, The theory of correlation would apply equally to cysts in all glands, and not to those in special ones only. This, however, is not so. In estimating the likelihood of a new growth occurring in any given cyst, these cavities may be divided into two grand classes—serous cysts, and mucous or glandular cysts; the one containing, as the names imply, a serous fluid, the other a colloidal or viscid matter in greater or less proportion. The former class, illustrated best by kidney cysts, never take on growth, but remain secretive all through their history; while the latter, though not always, by any means, giving rise to endogenous growth, are still at any time very likely so to do. In both these instances, cyst is common to them; gland influence and structure are in a measure common to them; secretion is common to them; and practically, both may be looked upon as excretive, so that in relation to ultimate ends, both would seem to be very similar in purpose. In what, then, do they differ? Only in this, that while the products of one are watery, those of the other are colloidal. I have no doubt that this is an essential point of divergence, but if so, it is only to give a result for the cause, if we go no further. What is the reason of this difference in the consistence of the products? It is to be found in this, I believe, that serous secretions are formed by membranes, or at any rate by glands which have close analogies with secreting membranes, while mucous fluids are formed by glands proper. If the analysis of the difference between gland and secreting membrane be carried yet further, it, I apprehend, resolves itself into a matter of difference in the amount of work done, and a difference in the number of working agents. To explain: A secreting membrane consists of basement layer and one or more layers of cells, while a gland is formed by a crowd of cells all huddled together in a bag or network. The more the workmen the more the work, or, expressing this in terms of secretion, the greater the number of cells secreting fluid, the greater number of cells will there be in that fluid; for secretion is, I take it, only a discharge of material, together with the bodies which obtained this from the blood or tissues. To pursue this line of thought only one step further; as has been said before, the more cells in any secretion, the more the likelihood of growth taking place.

In addition to this, it has been suggested that in their earlier stages gland cells have impressed upon them an errand of formation, and it is only when other forces come into play that this is converted into a secretive errand; they have, in fact, been bred up to growth, and to this they repair when functional life ceases. But in the case of membrane, this is not so; their elements were never formed for building up gland, and so they cannot revert to a craft of which they may be said to be utterly ignorant; they have no alternative action, and therefore cannot do otherwise than continue to secrete.[1]

But some one will say, "This connexion between growth and secretion is all very well if it can be supported by facts; but this is not so; you are obliged to admit that the majority of these tumours are not gland formations but something else." Now, while allowing that in their somewhat matured condition, a fibroma, sarcom, or myxoma in the breast, may be distinct enough in its nature; I am far from thinking that this is so in the earlier stages of its growth. A gland is further a compound structure, made up of gland cells, connective and fibrous tissue. If there is a growth of the cells, one would expect also an increase of the fibre, and this is what actually occurs. It, then, is quite possible that the growth of connective or fibre may be under more advantageous circumstances than those under which the cell elements exist; this being so, the former would increase at the expense of the gland tissue, the latter become crowded out, and the whole formation practically, as described, sarcomatous or otherwise. This is the more likely when we remember, that supposing, as we must in any part of this compound whole, a variety of tissues to be stimulated to growth, each element would hardly start fair in the race. In the one case, we have to do with cells whose life, as far as we can judge, is much shorter—if, indeed, what would be regarded as a degeneration in other structures be not their essential function—with elements that will rapidly proliferate and as quickly die, and this on the smallest exciting cause; in the other case, we have to do with a tissue less isolated in action, and therefore less prone to rapid change, and not so obnoxious to altered conditions. But to say this much is not to deny a glandular *nature* to many of these formations. This question of cell life is a fascinating one for unlimited speculation, more especially if pushed into the region of malignant and recurrent growth. Upon this time and space forbid our entering here. One may, however, before closing, just diverge for one moment to point out that these remarks, both in relation to innocent and cancerous tumours, seem to illustrate a pathological law, which teaches that if a growth occur in any part, it will, with but few exceptions, take on the form of such part in more or less perfect manner; and thus we find, in the case of the breast, a certain resemblance between cancer and other tumours. A very practical point is embodied in this, which, as every worker with the microscope in the field of morbid anatomy knows well, still needs reiteration. How often, to such a one's very great perplexity, morsels are sent to him, of which, perhaps, he knows nothing beyond the bitter fact that he is expected to express an opinion on the question of its recurrence. If our observer is wise, he will keep to a bare statement of description, and leave recurrence to futurity, which cannot fail him; but, unfortunately, such a barren announcement is generally very little consonant with the surgeon's hopes or fears; he cares little to be told that his knife has removed a lymphoma or rapidly-growing adenoma or what-not; he associates often gland tumour with innocence, and cancer with its surgical opposite; while the pathologist, as I say, knows well, that only in exceptional cases can it be said that such-

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[1] The distinction here drawn between gland and secreting membrane elicited some criticisms at the time of reading this paper as to its reality in fact. It would, I think, rather strengthen the theory brought forward did such a distinction not exist. This, however, is not so; for whether my reasons for making it be deemed satisfactory or not, we can hardly get over the pathological fact, that cysts, membranes, or glands—of which I quoted the kidney as a typical example—whose secretion is serous, are hardly ever liable to growth within their cavities. I can neither find recorded, nor have I seen in museums, a cystic kidney giving rise to papular growth from any of its surfaces, and the pathology of renal cysts is probably, therefore, simply one of tubular dilatation, and not one of new growth. The fact that the kidney is frequently the subject of cancer is hardly a case in point, seeing that there is no evidence of the growth commencing in the tubules, and it is equally probable that it may originate outside them in lymphatics or elsewhere.

and-such a growth is a *cancer*, while many most harmless-looking tumours rapidly recur. I am inclined to say for myself, that an answer to the question of recurrence is much more surely indicated by naked-eye appearances and experience, than by any histological inquiry.

Lastly, as to the light which these observations throw upon gland development, it may be remembered that I expressed a doubt whether these new formations were ever produced by the involution of a simple tube, while the formation of papillæ inside cavities is very general in what appear to be attempts at gland growth in many regions of the body. This uniformity of action in different parts cannot, I think, be a mere result of chance. Again, it seems very improbable that there should exist one developmental law for an early period of life, and another for adult age or senility, while no one, I suppose, now holds that new growths are omnipotent in their freedom from all law. Whatever, then, the name by which we characterize that force which ends in tumour, most will probably be ready to admit that it cannot be other than that same force which was impressed upon the one cell at its first beginning, and which sent it on its road of evolution; and we may, upon this, not unreasonably ground the assumption that the developmental processes gone through in the formation of glands in intra-uterine life, will be very closely imitated in extra-uterine formations; in other words, the clue to the nature of these pathological structures must be looked for in the field of normal embryology; and if so, then, by providing specimens easy of access, both by their numbers and size, morbid anatomy will, in its turn, react upon the latter, and facilitate a study at present surrounded by almost insuperable difficulties. This line of inquiry has indeed already made much progress through the able researches of Müller, Billroth, and others.

Part Second.

REVIEWS.

Annual Reports of the New York Asylum for Idiots.

Annual Reports of the Pennsylvania Training School for Idiotic and Feeble-minded Children, from 1856 *to* 1871.

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Final Report on the Experimental School, Massachusetts. Cambridge: 1852.

Report of the Commissioner in Idiocy to the General Assembly of Connecticut, 1856.

THROUGH the kindness of a friend in Toronto, we have now before us a large number of annual reports of training schools for idiots, imbeciles, and feeble-minded children from across the Atlantic. In no country in the world has the education of this unfortunate class been prosecuted with greater energy and success than in the United States. To say that a problem has been successfully worked in America, is a somewhat perilous way of recommending a trial of it in this country. But one thing we cannot deny,—that the United States have preceded us in recognising the duty of the State to give a proper amount of education to all the children of the country who may be in need of it. This principle has only recently been recognised in England; nor is it yet carried out in Scotland or in Ireland, though our legislators are at present busy with the subject. It is not surprising, therefore, that some states of the American Union have taken a much wider view of the duties of a government than we are yet prepared to carry out. Not only have they granted pecuniary aid to the schools for the blind and deaf, but a number of training schools for idiotic and imbecile children have been founded and maintained by the help of the State. The view upon which this aid is granted is clearly enunciated in many of the reports under review. Take the following, for example:—

"We have already referred to the principle adopted in the very infancy of our colonial existence,—that it is the duty of the State to require the education of *all* its children. Admitting this principle (and it would be difficult to deny it), and the conclusion follows legitimately, that it is the duty of the State to provide for the training of this unfortunate class, and that in such a way as that all may be liable to share alike in its advantages."[1]

In Great Britain, the care of the idiot has been left to the voluntary charity of the public; and, where the Government has interfered, it has not been to help those who have endeavoured to ameliorate the condition of this unfortunate class.

Under the Lunacy Act of 20th and 21st Victoria, idiots were included under the head of insane, and put under the charge of the Commissioners of Lunacy. In England, all those children sent for education to Earlswood and Lancaster, and other English institutions for the improvement and training of idiots, can only be admitted under the usual lunacy certificates, signed by two registered practitioners of medicine.

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[1] Report of the Commissioners to the General Assembly of Connecticut, p. 17.

As a general rule, the precautions necessary to take against lunatics are quite superfluous in the case of idiots or imbeciles. An idiot is unsound of mind very much in the same way as a child of two or three years old is of unsound mind; and to demand the usual formidable array of certificates and petitions before a feeble-minded child can be sent to a training school, is an outrage upon common sense and justice. It is an arbitrary regulation, which only tends to render the parents unwilling to send the most improvable cases to the only establishments where they can get a suitable training, and to thwart the noble efforts of the charitable founders and subscribers.

The Scotch Board of Lunacy have taken a more sensible view of the matter, and have not insisted upon anything beyond an application signed by the parent, and a notice of admission or description of the case from the medical officer. These institutions, which are better supported in England than in Scotland, are very far from being able to care for the large number of idiots in either country. Few people have got any idea of the number of idiots; and it is extremely difficult to get statistics, from the unwillingness of parents to return their children under such a heading. In the census of 1861, only 481 were returned as idiots or imbeciles in Scotland; but from evidence in the possession of Dr W. A. F. Browne, then Commissioner in Lunacy, 2236 had been, about the same time, actually visited by him, or by other medical men on whom he could rely. Dr Denis De Vitré, Chairman of the Royal Albert Asylum for Idiots at Lancaster, writing in 1871,[1] states that "the number of idiots and imbeciles in England has been appropriately estimated at 50,000, while the entire hospital accommodation yet provided is insufficient for 1000. In Ireland, the number of idiots by the census of 1851 was stated as 4906, or 1 to every 1336; the number of insane as 5074, or 1 in 1291 of the general population.

The above statistics of lunacy in Ireland are noteworthy, as the collectors have succeeded in getting something like a real return of the number of idiots; for there is no reason for believing this class more numerous in Ireland than in other countries. "No census," it is observed in the Report to the General Assembly at Connecticut (p. 76), "taken on the principle of the British or United States census, gives anything like full returns of this class, particularly of the younger imbeciles and idiots."

We are thus prepared for the conclusions of the Connecticut Commissioners:—

"We have thus presented the results of our investigations, and, we think, have demonstrated conclusively the duty of the State to aid in raising up these poor outcasts from the degradation of their present condition. When we consider that they are as numerous as the insane, eight times as numerous as the deaf and dumb, more than twice as many as the blind, that no other means are available for their improvement, and that, under these genial influences, they do attain to intelligence, usefulness, and manhood,—we feel that we have presented a claim on their behalf which an enlightened and liberal Legislature will not reject."

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[1] Dr De Vitré's calculation evidently does not include the Asylum for Idiots at Catherham, of which there is an account in *Good Words* for April 1872. He refers to the four English training schools.

Before granting public support to these institutions, the State legislatures acted with great caution. In Massachusetts an experimental school was tried for three years, the report of which is signed by Dr S. G. Howe, the author of a well-known work, "On the Causes of Idiocy;" and it was only on finding a real improvement in those subjected to training that permanent support was promised.

"Seven experimental schools, started under State patronage, have resulted in the establishment of as many public institutions, built and supported by these several states. In nearly every instance, these experimental schools have been located at the state capitals, where their modes of operation and their results could be conveniently scrutinized by the members of the legislative bodies upon whose favour they were dependent. They are, therefore, now the exponents of the intelligent convictions of the respective legislatures that founded them."[1]

The general plan seems to have been, that, on a given sum being raised by private charity, so much more was added by the legislature. The states which now maintain institutions of their own are, Massachusetts, New York, Pennsylvania, Connecticut, Ohio, Kentucky, and Illinois. Other states who have none of their own, send boarders to these institutions. In Canada there is none, though we are informed that it is contemplated to erect one at Toronto. In the annual reports of the American training schools, as well as the work of Seguin on Idiocy, published in America, a high degree of success is claimed; and it appears to us likely that State support should tend to render them more efficient, as well as more able to overtake the work before them.

In America, those cases who do not seem likely to profit by training, those labouring under decided ill health, as well as the insane and epileptic, are returned to their parents' homes. At the New York Asylum at Syracuse they are taken for a month, when a report is sent to their parents. Those who are maintained gratuitously are admitted in the precedence of their application, in consideration of their wants and capabilities, and not, as in Great Britain, by the votes of subscribers collected by personal solicitation. An ample staff of teachers is allowed, with salaries sufficiently large to induce them to stay in their situations.

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[1] Twentieth Annual Report of the New York Asylum for Idiots, 1871, p. 11.

The Annual Reports of Dr Wilbur, dating from 1852 to 1871, record, in an engaging style, the experience of a physician of ability and sound judgment, who has now devoted twenty years to the treatment and training of idiocy and the diseases which cause it.

The following quotations may be interesting to our readers:—"Idiocy, or that general mental condition which is commonly understood by that term, depends upon a defect or infirmity of some portion or the whole of the general nervous system, just as blindness or deafness depend upon some affection of the special nerves of sight or hearing; and just as complete and hopeless blindness and deafness will result when these special nerves are affected to a certain extent, so it is true that in certain conditions of the central nervous masses, the brain or spinal cord, there will result a degree of idiocy, or a form of idiocy, that, so far as any marked or permanent results are concerned, may be considered hopeless. In other words, the organic defect and the diseased condition cannot be remedied, and, therefore, the resulting mental deficiency cannot be obviated. The peculiar conditions, however, upon which the idiocy is based, are so beyond the reach of one's observation, are oftentimes so subtle in their character and pathological symptoms, that they can only be inferred (scarcely said to be proved) by a failure after a fair trial of the most approved means to obviate them."

Take, again, from the Seventh Annual Report:—"There is a class of children who are, in the early periods, of infirm or imperfect bodily organization. As a consequence, they are deficient in intellect: they are idiots, with all the absence of mental manifestations, and with the habits and tendencies of this state. During some of the critical periods of their childhood, or in the more radical change in the system from childhood to youth, the physical cause or infirmity underlying the idiocy is actually obviated or removed; but through the strength of confirmed habits, and from the fact that they are still surrounded with the same circumstances, they would continue in the same condition of mental inferiority. Exposed to the educational and elevating influences of a well-regulated institution, the effects produced seem almost like regeneration—the individual entirely emerges from the condition of idiocy."

In the First Report, Dr Wilbur states his view, that the most teachable age for idiots is "the proper school-attending age of ordinary childhood." As defined in subsequent reports, this is between seven and fourteen. "As such, they are free from the confirmed habits which constitute, in the main, the disagreeable or repugnant features of the common appreciation of idiocy. Their whole organization is more flexible, more susceptible of development. The physical defects or infirmities with which the idiocy is connected, or upon which it is dependent, are more amenable to proper rules of diet, regimen, or medicine."

Dr George Brown,[1] writing from a private institution, where the parents may be expected to allow the children to spend longer time in the establishment, remarks,—"The younger the pupil when entered, the better for him, and for us too."

Naturally enough, with pupils so young, there were no trades taught at Syracuse. The peculiar boast of the American training schools was, that they gave education in its broadest sense—the culture of all the human faculties, unembarrassed by the utilitarian views which in England make it such a peculiar object that the intelligence of the idiot should be directed to make him more or less supporting.

Of five teachers to ninety children at Syracuse, four were females.

In the Eighth Annual Report, Dr Wilbur remarks,—"Our general rule (the admission of pupils from seven to fourteen years of age) seems to be practically a just one. At all events, as it can be suspended, for proper reasons, in any individual case, by the action of the board of trustees, it can do no harm. Whenever, in the farther experience of the institution, it shall be deemed advisable to extend the limits of age in the reception of pupils, it can be done."

In the Twentieth Report, after enriching his experience by a visit to Europe, and after making some remarks upon what he observed at Earlswood, Dr Wilbur writes,—"Theoretically, the earlier in point of age deficient children are submitted to special training and instruction, the greater their prospect of ultimate benefit. Acting upon this, the mass of pupils selected were too young to be applied to any practical industry. Just when they had reached an age when they could be taught something useful, their terms of residence at the asylum would expire, and they be sent away to acquire elsewhere, and under less favourable circumstances, the real knowledge which they most needed. Thus, the ultimate end of all the educational efforts was made too remote for the observation and apprehension of the teachers."

In the regulations of the Pennsylvania Training School,[2] it is stated that the period of the greatest school improvement is generally from twelve to eighteen.

It was impossible but that the teaching of industrial occupations to idiots should not tend to their being admitted or retained to a later age. At Earlswood, a considerable number of the inmates are grown men and women. Both at Earlswood and Colchester life cases are elected. Idiots neither learn to speak nor to walk so soon as ordinary children; nor, as a general rule, are they able at so early an age to commence to work. It seems to us that, as a general rule, those from eight to fourteen receive more readily a scholastic education, whereas those above fourteen are much more able to learn to work; and some idiots can be taught to work very

[1] Report of Private Institution, Barre, Mass., 1866.

[2] Sixteenth Annual Report, p. 26. Philadelphia, 1869.

tolerably who cannot learn the alphabet, whereas others can be taught to read a little who are never apt at work. If the children can be kept long enough to give them both a scholastic and industrial training, so much the better.

We fear, in trying to give due honour to Dr Wilbur's reports, that we have so taken up our space as to leave no room for doing justice to the claims of the other reports and papers at the head of our review; indeed, each of them is well entitled to a separate notice. The reports of Dr S. G. Howe and Dr Edward Jarvis, of the Massachusetts School, are very interesting and instructive reading. We do not know anything better of its kind than the Twentieth Annual Report by Dr Jarvis.

Those of Dr Isaac Kerlin, of the Pennsylvania Training School, are written with great ability and warmth of feeling. Dr Kerlin has a kindly word to say in favour of epileptic idiots, which are excluded from the gratuitous benefits of almost all training institutions. Out of 111 of this class, he claims 16 cured and 57 improved.

A striking feature in the American reports is the number of pupils who have become self-sustaining. This is, no doubt, an easier problem to solve in America than in Great Britain. In the New World there is a much greater demand for bodily labour, especially in agriculture, and land is cheap and easy to be had. It is generally recognised that there is more chance of idiots and imbeciles learning to make their bread by such labour than by any other. Several of those who have been cared for by Dr George Brown in the Private Institution for the Education of Feeble-minded Children, Barre, Mass., "are now," he writes, "filling stations of usefulness and respectability in life, having served in the army and navy during the war, are managing small farms, or maintaining themselves by some mechanical trade."[1] "Of 500 individuals," writes Dr Kerlin,[2] "received and trained at this institution, 81 are capable of earning their own support in domestic service, farming, or certain shop employments, under influences of favourable protection, such as have been named."

In Dr H. M. Knight's able and interesting report of the Connecticut School,[3] 7 pupils are deemed capable of self-support, and 3 of these were reported as actually self-supporting; 2 children were also sent to enter a public school.

The same want of space compels us to pass over the instructive pamphlet of Dr Seguin on Idiocy, its Diagnosis and Treatment, which came before his larger work on Idiocy. His other pamphlet, published in 1870, has been already reviewed in this Journal.

The article of Dr Wilbur upon Aphasia is of a thoughtful and suggestive character. Idiotic mutism is a subject which has been little noticed, but which presents some features well worthy of study.

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[1] See Report, Barre, 1866, p. 14.

[2] Eighteenth Report, p. 9.

[3] Hartford, 1870, p. 7.

A Manual of Zoology, for the Use of Students. By HENRY ALLEYNE NICHOLSON, M.D., D.Sc., etc. Second edition, revised. Blackwood and Sons.

THE first edition of this work was noticed so recently in our pages that a lengthened review of it at present is unnecessary.

Suffice it to say that the second edition differs from the first chiefly in this, that it is larger. That this is an advantage we are inclined to doubt.

As in the first, so in the second edition, that portion of the work which is devoted to the lower forms of animal life seems somehow to recall to memory the notes of a song which at one time fell pleasantly on our ear within the walls of the Edinburgh University. The notes themselves have died away, but the echo is returned from the pages now before us.

The fact that within twelve months a second edition has been called for must be a source of satisfaction to the author, inasmuch as it shows that his labour has not been in vain. At the same time we would humbly suggest that, in the event of a third edition being demanded, a little less of detail and more of principle might be found advantageous.

Notes on Comparative Anatomy: A Syllabus of a Course of Lectures delivered at St Thomas's Hospital. By WILLIAM MILLER ORD, M.B. Lond., M.R.C.P., etc. London: J. and A. Churchill.

THIS syllabus contains the substance of the author's course of lectures on comparative anatomy. It will form a good guide to the student, in so far as it directs his attention to the leading anatomical peculiarities of the different forms of animal life. The essential anatomical characteristics of these groups in relation to the various functional systems, are given clearly and well. As an outline it is excellent; the details, however, the reader must fill in for himself.

The Notes, we have no doubt, will be largely made use of in these days of "cram," when it seems essential to the progress in life of the student, and more particularly of the medical student, to "get up" the largest amount of knowledge in the shortest space of time, regardless of any higher consideration than that of passing an examination. As a syllabus of a course of lectures, the Notes are unexceptionable, but we doubt the propriety of publishing these in the form of a book, which in the hands of those for the use of whom it is designed, will but tend to encourage an ever-increasing evil,—that of "cram." Let the student make such an abstract for himself, and we may rest assured that he will have attained a much more satisfactory grasp of the subject than can ever be gained by committing, parrot-like, to memory the contents, excellent though they be, of a work like that now before us.

On the Temperature in Diseases. By C. A. WUNDERLICH, M.D., etc. Translated by W. BATHURST WOODMAN, M.D.

A Biennial Retrospect of Medicine and Surgery for 1869–70. Edited by Mr H. POWER, Dr SHEPHERD, Mr WAREN TAY, Mr R. B. CARTER, Dr BARNES, and Dr T. STEVENSON.

Lectures on Clinical Medicine. By A. TROUSSEAU, M.D., etc. Translated by Sir JOHN ROSE CORMACK, Kt., M.D. Ed. and Paris, F.R.S.E., etc.

Atlas of Portraits of Diseases of the Skin. Eleventh Fasciculus.

THE above-mentioned works constitute the thirteenth annual issue to its subscribers of the New Sydenham Society, and though relating to different subjects, we have classed them together, because it seems of more importance to the profession that they should know the very valuable practical information they can secure for one guinea, than that at this time of day they should be treated to an elaborate critique on Trousseau's Clinical Medicine, or on Wunderlich's Treatise on Thermometry; the worth of these volumes being well known to all but the merest tyro in medicine. As to the Biennial Retrospect, it is as good as any of its class: of little value to town practitioners possessing easy access to large, well-selected, and well-catalogued libraries, it is no doubt of great value to country practitioners, whose resources in that respect are more limited, and whose requirements are of some consequence, if we estimate them by the numerous works of the kind intended to supply them. The fasciculus of Skin Diseases supplies life-size portraits of Pityriasis Rubra, Papular Syphilis, with Indurated Chancres, and Pruriginous Impetigo following Varicella, which are extremely beautiful, and look life-like, but which, to our mind, would have their value very much enhanced by the addition of a printed sheet containing a concise history of the case; these might at first be issued in loose sheets, and subsequently re-issued in fasciculi, when a sufficient number had been printed. The additional expense thus entailed, might be amply provided for by the issue of only two plates instead of three; while, as the practical value of the plates would be very greatly enhanced, and as the atlas alone is worth all the money subscribed, not only would no subscriptions be likely to be lost by this alteration, but many, we think, might be attracted by it.

To return to Wunderlich's Thermometry, it is well to recollect that this contains not only observations on the temperature in disease, but also in health, and is a complete epitome as to the history of the subject up to date. It is no infallible guide either to diagnosis or treatment, but is nevertheless a work of reference, absolutely necessary for all who would keep themselves abreast of the day, in relation to so important a matter as corporeal temperature.

The importance of Trousseau's Clinical Lectures is too well known to require insistance upon here, and the only parts to which we desire to refer, are those in which he speaks of the food of infants and of their weaning, because in both of these we think he is somewhat in error. He states that a nursing infant, of four or five months old, ought to take about 15,000 grammes (nearly 20 oz., or one pint) in the twenty-four hours; but scarcely any infant of only one month old will be satisfied with only one pint of milk; many will take a quart, and the average lies between; while, of course, the quantity required at four or five months must be considerably increased. In children actually nursing, a knowledge of the amount required is of little importance, because they help themselves to satiety, without the use of a measuring glass; and if found not to thrive, they have their wants supplemented by food, or by the provision of a more efficient nurse. In those brought up by the hand, it is far otherwise; and if to an inefficient supply of *average* cow's milk—not the milk of one cow, but the mixture of several, as our author very properly recommends—we add one-third of water (p. 153), we still further reduce the poor infant's nourishment, and ought not to wonder that rickets and all the many ailments which follow defective nutrition result. It is quite as easy to bring up a child healthily on the bottle as by a nurse, if he be sufficiently fed; but it is much more easy to starve him the one way than the other; hence the great mortality amongst bottle-babies. Again, Trousseau very properly states, that the most serious difficulties of nutrition arise at the cutting of the eye-teeth—not because that is a difficult matter, because they are so sharp that it is not; but because they have to force their way in a closed space between two teeth—and he proposes to defer weaning till after that period, that is, on an average, till the child is eighteen months old. But long before this average period, the milk of an average nurse is too watery to be of any nutritive value, and is much better replaced by food of a more nutritious character, while any delay beyond the average in dentition is far more probably due to deficient nutriment than to any other cause, and is most efficiently to be met by prompt weaning, and the supply of more nourishing food. Under all circumstances, the food of the child ought to be proportioned to his requirements, and not regulated by any theoretical ideas; and the requirements of the child ought to be judged of according to his development, and not deduced merely from his age; and the absurdity of having recourse to averages, in this or any other question, is very well shown by Trousseau pointing out, in regard to dentition, that amongst all the boys who furnished an average of seven months as the period of eruption of the first tooth, in not one single case did the first tooth appear at this age; while, amongst the girls, the average age of six months applied only to one-fourth of the facts. An average is only an abstraction, representing a fact intermediate between two extremes, which itself may only seldom or perhaps never occur. It is absurd, therefore, to attempt to base accuracy of knowledge upon a system of averages, or to ask, in regard to any question, formulated truths from statistics which they cannot furnish.

We cordially recommend the New Sydenham Society, and its valuable publications, to the favourable consideration of our readers.

A Handbook of Therapeutics. By SIDNEY RINGER, M.D., etc. Second edition. London: H. K. Lewis: 1871. Pp. 483.

Dr Pereira's Elements of Materia Medica and Therapeutics. Edited by ROBERT BENTLEY, M.R.C.S., F.L.S., etc.; and THEOPHILUS REDWOOD, Ph.D., F.C.S., etc. London: Longmans, Green, and Co.: 1872. Pp. 1093.

THESE two works are typical of the past and of the coming times. Because a practitioner has to employ drugs in the cure of disease, it is absurd to expect him to possess a minute knowledge of their natural history and chemistry; he might as well, as Huxley has said, be expected "to belong to the Iron and Steel Institute, and know all about steel because he uses knives." Fancy an inquiry into Bessemer's process forming an integral portion of a medical examination; but would this really be more absurd than to make the fitness of a student to treat disease to hinge upon his knowledge of what a schizocarp is, or how "ethers, aldehydes, and acids are derived from the first four homologues of the alcohol $C^2H^4O^2$."

In recent attempts to simplify therapeutics, and present to the student the physiological action of the drug apart from its natural history and chemical constitution, Dr Ringer, so far as published works are concerned, has the field before him. As might naturally be expected, there is an infinite variety in the value of his separate articles; some of them, such as that on Chiretta, p. 418, are bald to the very extreme of inanity, and had better have been entirely omitted; while in all, we think, the total exclusion of all reference to the natural history is a blot, which ought in subsequent editions to be remedied. It is surely a matter of interest and of polite learning to know what ergot or turpentine is, and from what plants they are derived, and it must conduce to our influence with our patients to be able to state concisely, if asked, what the drug is which we propose to employ, though it would as certainly be a waste of time for us to get up its minute botanical and chemical history, while such facts would be not more unintelligible than useless to them.[1] In various of the articles, we note that Dr Ringer has not brought his information quite up to date; for instance, under the head of Ergot, the subcutaneous injection of ergotine, which has proved itself so energetic as a hæmostatic, is not even alluded to, and the employment of electricity as a therapeutic agent is also entirely omitted. Nevertheless, the fact that Dr Ringer's work has reached its second edition in so short a period, conclusively shows that it fulfils a want which has been felt, and one which we feel assured, from the well-known care and accuracy of the author, it will fulfil with even more acceptance in future editions, which will no doubt be called for.

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[1] Since this was written, a gouty old gentleman has illustrated the appositeness of this remark, by his vainglorious chuckling over a former medical attendant in regard to want of knowledge of the botanical source of Veratria and its distinction from Veratrum.

We should, however, like to impress on Dr Ringer the great advantage of using an alphabetical arrangement for his articles; it is as absurd as it is confusing to find Aconite following Ipecacuanha, especially in a work which has only therapeutical ends in view, and which has no hankering after botanical or chemical mysteries. We speak feelingly on this subject from long acquaintance with Sir Robert Christison's Dispensatory, which, for this very alphabetical reason, is so easy to consult.

Dr Pereira's Elements are here presented to the student in a novel dress, Messrs Bentley and Redwood having very carefully brought up the botanical and chemical portion to the standard of the present day. In this respect it presents a most excellent example of a kind of work which, in so far as it is intended for the medical student, will soon, we trust, be only looked upon as interesting from an antiquarian point of view, and the circulation of which it will be hopeless even to attempt to increase by tagging on to a series of instructive and interesting botanical and chemical essays detached therapeutical memoranda, especially when those are in themselves essentially antiquarian. What can be said for a work professing to teach the therapeutics of the present day, which not only ignores the hæmostatic use of ergotine, but which recommends that ergot should be employed to assist the dilatation of the os uteri (p. 392), or which recommends low diet, repeated bloodletting, and digitalis to reduce hypertrophy of the heart? Such statements betray such utter ignorance of the action of these drugs, that it is quite unnecessary for us to give further proofs—which might easily be done—that the therapeutical department of this work is very far behind the others, and is quite unworthy of the companionship in which it is found.

A Guide to the Examination of the Urine. By J. WICKHAM LEGG, M.D., etc. Third edition. London: H. K. Lewis: 1872. Pp. 96.

The Urine and its Derangements, etc. By GEORGE HARLEY, M.D., F.R.S., etc. London: J. and A. Churchill: 1872. Pp. 376.

WE have already recommended Dr Legg's little work to all clinical clerks, as a concise manual of all the matter needful for them to attend to. This third edition is somewhat enlarged, and in it there have been adopted several of the improvements we formerly suggested. A more enlarged experience, and more careful reflection, will no doubt modify some of those improvements still more in accordance with our views, and will also prove the needfulness of those other improvements which we formerly pointed out. At present it is fairly accurate for so concise a manual.

In Dr Harley's work we have a volume of more pretension. Though by no means perfectly accurate, it is yet by far the most readable, instructive, and interesting manual on the subject issued, since Golding Bird took the medical world by storm. The New Sydenham Society's translation of Neubauer and Vogel's work is unquestionably the most accurate and scientific work on the urine in the English language; but it is dry and unreadable compared with this, which has also the great advantage of containing all the information upon any given subject continuously in one place, which is a great saving of trouble to the student. It is clearly printed, on slightly toned paper, and the illustrations, though not numerous, are characteristic, and are carefully and distinctly drawn. The chapter on the Clinical Significance and Treatment of Urohæmatin, and of the abnormal pigments found in the urine, seems to us specially worthy of consideration.

A Text-Book of Pathological Histology: An Introduction to the Study of Pathological Anatomy. By EDWARD RINDFLEISCH, Professor of Pathological Anatomy in Bonn. Translated from the Second German Edition by W. C. KLOMAN, M.D., and F. T. MILES, M.D., etc. Philadelphia: Lindsay and Blakiston. London: Trübner and Co.: 1872. Pp. 695.

RINDFLEISCH'S work is too well known and too much esteemed to need any commendation from us. The second edition has been done into moderately readable English by the translators, who nevertheless deserve the thanks of all who are unable to peruse it in the original. Originating, as the author tells us it did, more at the microscope than at the writing-table, it would, of course, be comparatively valueless unless profusely illustrated, and the 208 woodcuts which adorn its pages will be found to supplement clearly and distinctly the author's description. Pathological histology is, if possible, of even greater importance to the student of medicine than normal histology; for while the latter gives us the microscopic or ultimate structure of normal tissue, the former shows us how the coarse pathological changes of these tissues, such as enlargements, diminutions, softenings, indurations, etc., are founded in certain changes of these ultimate elements; it explains the one by the other. Nay, more, it sometimes goes a step farther, and gives us a lesson in therapeutics, which, if earlier learned, might have spared much controversy, and may even yet convey instruction to some controversialists who still survive. It has been a favourite doctrine with some, that heat and moisture are useful in inflammation by favouring cell-growth ; but modern pathology teaches us that the application of heat of a proper degree increases the amœba-like movements of the wandering cells, tends to diffuse them through a greater space, and thus favours their return to the circulation through the lymphatics, thereby promoting the resolution of an inflammation. It is only when applied in excess that heat ceases to have this dispersing power, acts as an irritant, renews the process of emigration, increases its intensity, and favours suppuration (p. 107). It is premature, however, to expect much therapeutic information from pathological histology, a branch of science which as yet is only in its infancy, having been founded by Rokitansky and Virchow within our own time, while the researches of Cohnheim and others, which have entirely revolutionized our views regarding it, and made even those of Virchow obsolete in some respects, are but of yesterday. It is works like the present which make us feel our own backward position in having no pathological institute in which similar practical observations could be made, and our vast pathological material utilized, not only for instruction, but for the advancement of science; and it is such works also that make us feel the absurdity of muddling the brains of our students with valueless botanical and chemical minutiæ, while fields so rich in promise for the future lie waste and uncultivated: it is not so much medical examination as medical education that wants to be remodelled. We cordially recommend this valuable work to our readers, and especially to our younger readers, as one that will repay their careful study.

Part Third.

MEETINGS OF SOCIETIES.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXI.—MEETING VIII.

13*th March* 1872.—Prof. SIMPSON, *Vice-president*, in the Chair.

I. *Prof. Simpson* exhibited A FIVE AND A HALF MONTHS' FŒTUS, that had been thrown off by a patient labouring under a severe attack of smallpox The pustules were distinctly seen all over the fœtus, especially on its back. With regard to the time a dead fœtus is retained *in utero*, Prof. Simpson stated that three weeks generally suffices for expelling it; the membranes and placenta first undergo a fatty degeneration, and then they act as a foreign body, exciting uterine contractions.

II. *Prof. Simpson* showed A FŒTUS WITH THREE LEGS, resembling the impression on an Isle of Man penny. Attached to the placenta was a small piece of a second cord.

III. *Dr Young* stated that a little more than a year ago he showed the Society an umbilical cord which was only ten inches in length. He had attended the same patient a few days since during her second confinement, and this time the cord was eleven inches long.

IV. *Dr Pattison* mentioned a case of SEVERE HÆMORRHAGE that had lately occurred in his practice. He was sent for suddenly to attend a lady, whom he found to be losing an enormous quantity of blood. On examining her he could not detect blood coming from the os uteri. She had only been married three days, and it was not her menstrual period. The hæmorrhage was arrested by full doses of the pernitrate of iron and the application of cold to the vulvæ.

V. CASE OF PELVIC CELLULITIS FOLLOWED BY PERITONITIS.

BY DR JAMES YOUNG.

In the following case some remarkable changes occurred during the progress of, and subsequent to, the primary inflammatory action which ultimately caused the patient's death. Many, I presume, will allow that one of the most troublesome obstetrical accidents which are apt to occur is miscarriage, and also that hæmorrhage is frequently a cause of most anxious care and solicitude. One of the most dangerous consequences of such an accident is inflammation, which frequently occurs, and which, in this case, proved the cause of the patient's death. The patient is generally found suffering from hæmorrhage, with the placenta left in the uterus. Mrs ——, æt. 32, was born in Edinburgh, of healthy parents, who lived to an advanced age. She had had six children and several miscarriages during her married life of fifteen years. Mrs —— was greatly alarmed by fire on the 20th November last, when ten weeks pregnant. Hæmorrhage came on, and continued three weeks, more or less, until the 8th December, when the fœtus was expelled. A medical man was sent for, and attended for a week, after which a change was recommended to the country. While there, considerable hæmorrhage continued for two weeks, requiring tonics and the liberal administration of wine. Notwithstanding the treatment and rest, the hæmorrhage continued until she returned to town, on the 2d January last. I saw her on the 3d, and found her very weak, pale, and anæmic. I examined the uterus, and thought there were indications of some placental remnant, which was expelled during the night. The hæmorrhage ceased on the 5th January. She had little, if any, pain until the 7th, when she had a severe rigor—pulse 120, and weak, with diarrhœa. She complained of severe pain in the region of the uterus. Some days thereafter, Prof. Simpson visited her, and confirmed my opinion that the case was one of pelvic cellulitis. A blister was applied above Poupart's ligament, on the right side, and occasional mild purgatives were given; also milk, beef-tea, and moderate doses of brandy. On the 12th the pain was very great, and, on examination, I discovered an abscess of considerable size forming between the uterus and rectum. I ordered warm-water injections and sponge-peline fomentations over the pubic region, hoping that the abscess might discharge itself per rectum or per vaginam. On the 15th, I opened it with the trocar and canula, and removed a saucerful of putrid and most offensive pus. I ordered vaginal injections to be continued, and on the 16th Mrs —— was greatly relieved, which was indicated by her countenance. On the 17th, her reply to my interrogation was, "Very well." I prescribed iced champagne, with beef-tea, milk, and white of eggs. To my great dismay she complained of considerable pain over the abdomen on the 19th, and, on examination, I discovered the whole belly to be tympanitic, with tenderness on touch, all over. There had been no fresh rigor, which made the extension of the inflammation all the more unaccountable. Turpentine stupes were immediately ordered to be applied at frequent intervals, with small doses of opium, and a due amount of nourishment. Bowels to be gently relieved. On the 20th, the pulse rose to 130. Hiccup came on, and vomiting, the stomach showing the signs of irritability usual in such cases; and the patient died on the 21st January.

I am indebted to my friend Dr Charles Bell for a copy of his excellent treatise, entitled "Constitution of Women, as illustrated by Abdominal Cellulitis," and I find, on perusal, that the connexion between cellulitis and peritonitis is admirably brought out,—see page 24. Dr Bell, at page 26, says, "It is also a striking characteristic of this disease that it is liable to have sudden and alarming exacerbations, which are attended by an increase of pain and fever, indicating those occasional attacks of peritonitis, which, if not attended to, may prove fatal." Dr Bell also, at page 44, refers to occasional attacks of cellulitis coming on after uterine operations, but at that time had only met with two such cases. I have seen several annoying instances where perimetritis followed the use of sponge-tents and pessaries.

Prof. Simpson recommended that these abscesses be always opened early for fear of their rupturing. The difficulty is to determine whether it is a peritonitic or cellulitic abscess.

VI. CASE OF ACUTE YELLOW ATROPHY OF THE LIVER. BY DR M'DOUGALL, COLDINGHAM. READ BY PROFESSOR SIMPSON.

Mrs Wood, aged 30, a strong muscular woman, the mother of five children, was, on the 5th September, after an easy natural labour, delivered of a weakly male child. The placenta was united by firm adhesions to the uterus for one half of its extent; small abscesses were detected scattered over its surface, together with other alterations in its structure, indicating inflammation of its substance. Before her confinement, she complained for upwards of two months of a feeling of languor, disinclination to work, inability to lie on right side, becoming livid in face, loss of appetite, intermittent jaundice, occasional vomiting, costive bowels, and dyspeptic symptoms. These symptoms she attributed to her pregnant condition, and hence did not seek for medical advice. Four days after her confinement she rose and went about her ordinary household duties, and for a week after felt stronger than she had done for some months.

I ceased attendance on the 12th, and did not see her again until the 25th, when I found her confined to bed, and was very much struck by the extreme pallor of her countenance. The conjunctivæ were jaundiced, as also the neck, chest, and arms; the lower part of the body was almost entirely free from yellow discoloration. The jaundice was most marked on the right side. The lochial discharge was of a dark venous character, and occasionally excessive. The tongue was moist, furred in centre, red at tip and edges; there was great thirst; pain in epigastric region after food, and feeling of nausea; bowels costive. Pulse 120, small and weak, but regular; respirations 30, temperature 101°. Skin moist, covered with clammy perspiration; sweating at night, principally confined to the roots of the hair, and most complained of when awakening from sleep. Copious flow of milk, and patient continues to nurse her child. Urine scanty, and high-coloured, sp. gr. 1025, contained slight trace of albumen, bile pigment, and a few scales of urea; marked loss of flesh.

The physical examination of the chest revealed a condition of incipient phthisis, manifested by increased depression under both clavicles anteriorly; harsh inspiration; prolonged harsh blowing expiration, most distinct under right clavicle posteriorly. Along with the above alterations of the respiratory sounds, slight crepitation was heard at the right apex; cardiac sounds were feeble, with a faint blowing systolic murmur heard at the base.

Abdomen.—The right hypochondriac, epigastric, and one third of the left hypochondriac regions were occupied by an enlargement, smooth on its surface, and extremely tender on palpation and percussion. The lower border, which extended almost to the umbilicus, slanted upwards, and was intolerant of the slightest pressure. This hepatic enlargement measured 6½ inches vertically in the right mammary line, and was proportionally increased in the axillary and median lines. The *spleen* was also considerably enlarged. To have six leeches applied to the epigastric region, followed by fomentations, and a calomel purge.

26*th.*—The leeches having bled freely, she felt considerably relieved, and enjoyed four hours' refreshing sleep. The liver, still enlarged, is slightly more tolerant of manipulation. The bowels were four times moved after the purgative; the stools were light-coloured, and were of an insupportably fetid odour. She complained of nausea, and has vomited during the night a large quantity of gray clay-like mucous fluid; the jaundice is more distinct; the lower part of the body still continues free; a clammy moisture covers the whole body. The urine passed was found to contain albumen, casts, epithelial cells, bile pigment, blood globules, and, on adding nitric acid, a few crystals of urea; pulse 120; respirations 32; temperature 100°. Muriatic acid prescribed.

It is unnecessary to recount her condition day by day; suffice it to say, that she continued without manifesting any new symptom, save progressive weakness, until the 6th October, when the hepatic enlargement was found to measure 7 inches in the mammary line, and distinct fluctuation was discovered over a circumscribed area of 3 inches; the pain over its surface was much more acute, increased not only by examination, but also by swallowing food. Frequent vomiting of dark-brown masses; petechial spots are found scattered over the upper part of the body and right leg; the perspirations continue profuse; the countenance is extremely anxious, indicative of suffering, and of a pale yellowish hue; the jaundice has now extended to the lower part of the body. She complains of severe frontal headache, and shooting pains in the shoulders, hips, and knee-joints; the bowels continue costive; the urine is of a light ale colour, depositing a very copious white precipitate, which, examined under the microscope, was found to be composed of oil globules and granular matter, a few tube-casts, and epithelial cells. The tongue dry and furred; pulse 130; temperature 103°; respirations 35. Muriatic acid to be continued, and large doses of quinine; purgatives.

7th Oct.—Passed an extremely restless night; bowels moved; stools dark-coloured; vaginal discharge much more abundant, and comes away in gushes when she is moved in bed; the hepatic tenderness continues extreme; the pain is so intense, that the least attempt at percussion causes her to cry out (more especially in the middle line to the umbilicus, and from the end of the sternum along the lower border of the ribs). A doughy feeling is discovered on palpation, extending to 2½ inches in the vertical direction, and 3 inches transversely; fluctuation not so distinct; no vomiting, but severe pain and nausea on taking food; perspiration still continues; pulse 108; temperature 100°. A pint and a half of dark smoky urine was passed during the night, which, on cooling, deposited a very abundant sediment, consisting of albumen, blood-cells, epithelial cells, tube-casts, crystals of uric acid, and urate of ammonia. The petechial spots are more diffused over the body. The pulmonary symptoms continue to increase in gravity; moist sounds are discovered under both clavicles, with increased vocal resonance, and dulness on percussion.

11*th.*—For the last four days her condition has varied little; the only additional symptom being a feeling of drowsiness, and occasional delirium; she lies for hours in a dozing state, but does not sleep; can bear percussion of hepatic region somewhat better; the dulness now extends to only 4 inches in the vertical direction; slight expectoration of blood; epistaxis; lips anæmic, with a few hæmorrhagic spots; the breathing is very much laboured, and she complains of suffocative sensations coming on at intervals; an incessant tickling cough causes her considerable annoyance; the jaundice is a little more decided, and the hæmorrhagic spots are somewhat more numerous; the pulse has varied in frequency since last report from 98 to 110, it now being 140, and becoming smaller; the temperature since the 7th has not risen above 104°, or been lower than 100°; the urine, light-coloured, contains no albumen or urea; it deposits a very copious sediment, so abundant as to render the urine of the consistence of pea-soup; two drachms were evaporated, and found, under the microscope, to be almost entirely composed of tyrosine and leucine.

14*th.*—The vomiting of dark gray, grumous matter has, for the last twenty-four hours, been so frequent that no internal remedies have been administered. The bowels, notwithstanding the use of strong purgatives, have not been moved for three days. She lies on the left side, and dreads the least movement of her body, as it causes the most excruciating pain in the right hypochondriac region. The jaundice has in great measure passed off, and is replaced by a ghastly pallor. The lips are covered with hæmorrhagic crusts; the petechial spots are scattered over the whole body; both legs are œdematous, and covered with dark-coloured bullæ; the skin is bedewed with moisture; night-dress wet with perspiration. She remains for hours in a state of apathy. The hepatic dulness only measures 1½ inch in the vertical direction. The urine is sometimes passed unconsciously, is darker coloured, and deposits on cooling a greenish-yellow sediment, wholly composed of leucine and tyrosine. Pulse 160, jerking and irregular; respirations 50; temperature 105°.

15*th.*—Semi-comatose; muttering delirium; excruciating pain in back, subject to paroxysmal aggravation. During the severity of the attacks she is with difficulty confined to bed. Incessant vomiting of tar-like matter; bowels moved, stools of dark colour, intermixed with clots of blood; copious epistaxis occurred twice during the night; urine not passed for eighteen hours; a pint and a half was drawn off, of a dark amber colour; on standing a greenish-yellow sediment was thrown down, found to consist of bile pigment, and numerous crystals of leucine and tyrosine. Pulse 170, small, thready, and intermittent; respirations 56, extremely laboured; temperature 106°. On percussing the hepatic region, it was impossible to discover any dulness.

16*th.*—Remained unconscious during the greater part of the night; the condition of stupor interrupted by moans and piercing screams; pupils widely dilated, but sensitive to light; convulsive movements set in about 4 A.M., and recurred at regular intervals till 8 A.M.; epistaxis and menorrhagia (so severe as to require the local application of astringents and plugging) set in two hours before death, leaving her completely blanched, with sighing, breathing, small quick pulse (180 was counted); temperature, half an hour before death, reached 109·4°; urine and stools passed involuntarily; the skin moist with perspiration; the whole body was covered with petechial spots; at certain parts a large quantity of blood was extravasated under the integument; the right leg was more œdematous than the left. Died comatose at 9 A.M., death being preceded by severe convulsions. No post-mortem examination was allowed. About six ounces of urine were drawn off after death, and contained bile pigment and crystals of leucine and tyrosine in great abundance.

Although I had not the satisfaction of the corroborative evidence supplied by an autopsy, I think there can be no doubt as to the nature of the disease from which this patient suffered, and under which she ultimately succumbed. The symptoms generally considered diagnostic of acute yellow atrophy were strikingly developed in this case, viz., jaundice, numerous hæmorrhages, hepatic atrophy, and the presence of leucine and tyrosine in the urine. I must confess that, during the preliminary stage of hypertrophy, I was very undecided in my opinion; and, indeed, for some time was quite unable satisfactorily to explain her condition. The stage of hypertrophy was peculiarly puzzling, more especially as in no case of acute yellow atrophy that I have been able to peruse, is it distinctly stated that inflammatory enlargement has been observed to precede the condition of atrophy. The points which, in this case, appear to be deserving of special notice are the following:—

1*st*. *The Prolonged Preliminary Stage.*—It appears likely that the disease had begun two months before confinement.

2*d*. *The Marked Hepatic Enlargement*—measuring at one time fully seven inches in the vertical direction. This enlargement was also attended with very distinct fluctuation, leading at one time to suspect the existence of abscess. It is just possible that hypertrophy may in all cases precede the atrophy, but, in consequence of not being sufficiently early brought under examination, may have eluded detection. Such, I am aware, was the opinion of the late Dr Bright; and if it is allowable to form an opinion from one case, I feel very much inclined to agree with him. The sequence of events which suggested themselves to my mind as occurring in this case were as follows:—Absorption of poison from within or from without—most probably from the diseased placenta—leading to toxæmia, and manifesting itself by typhoid symptoms, the special hepatic, splenic, and renal affections being secondary results. The hepatic changes might be compared to the lungs in pneumonia—condensation and enlargement, softening, rapid absorption.

3*d*. *Non-detection of Leucine and Tyrosine until Hepatic Atrophy sets in.*—The long continuance of jaundice, together with febrile symptoms, made me suspect acute yellow atrophy, and led me to examine the urine for those substances before symptoms of hepatic atrophy had manifested themselves; but I was unable to discover their existence until the 11th October, when diminution of hepatic dulness indicated the commencement of atrophy. This circumstance would lead one to conclude that there is some connexion between the absorption of the hepatic substance and the formation of leucine and tyrosine.

4th. The Increase of Febrile Symptoms coincident with the Occurrence of Atrophy.—The disintegration of the hepatic cellules, and their absorption into the blood, may have been the main cause of the increase of these febrile symptoms.

5th. The profuse perspirations, which were more abundant towards the close, seem to indicate an effort to get rid of some blood-poison.

Professor Simpson remarked that this disease occurs more frequently in women than in men, and that it especially attacks pregnant women. He had only seen one case of it in a female who was not pregnant, and in that case the symptoms were not well marked. In many cases it is known that the atrophy comes on at once; the preliminary hypertrophy in Dr M'Dougall's case he considered very peculiar.

Dr Fraser had had under his care a very interesting case, which was seen on several occasions by the late Sir James Simpson, who diagnosed acute yellow atrophy of the liver. At first the liver was supposed to be enlarged, and afterwards it seemed to get very small. On post-mortem examination, however, the liver was found to be of the normal size, yellow, and very fatty; the duodenum at its upper part was slightly inflamed. The patient was ill for two months, the principal symptoms being diarrhœa and vomiting. Throughout her illness her tongue remained clean, and her appetite good. There was no jaundice, and the urine did not at any time contain bile.

Part Fourth.

PERISCOPE.

Edible Snails.—The ancients had a decided taste for shell-fish; the Romans were great lovers of oysters; with us, the sea-urchins of Liguria enjoy a certain reputation; finally, snails were admitted to the best-furnished tables, if we are to credit the discovery of different alimentary remains made among the Gallo-Roman subterraneous buildings brought to light in the Cathedral of Troyes, where snail-shells and oyster-shells were found in company. The taste of the ancients for molluscs is with the moderns transformed into a true passion, which renders insufficient the resources of natural production, and would have led to the destruction of the species preferred, if the art of man had not attempted their artificial reproduction, education, and domestication, so to speak. At present the oyster and the mussel are cultivated on the seashore, whilst in the interior snails are collected and fattened to satisfy the increasing demand for them.

The snail is as much sought after in the south as in the north; the inhabitants of Provence have a marked preference for the "terrasan" (*Helix melanostoma*), and for the "naticoid" snail, a species with delicate flesh eaten in Spain and in Italy. The Parisians have for some years shown a marked liking for snails; the Belgians and Swiss also consume them largely.

But if the snail is eaten to some extent everywhere, it is to be acknowledged that Champagne is its true native country. There the snail is a national production, as its name of "oyster of Champagne" testifies: the production of the snail for all Champagne, and its preparation for the town of Troyes, constitute a monopoly of which it would not be easy to deprive them. Troyes has the reputation of preparing in a superior way its snails and its pork, as Strasbourg is famous for its *pâtés de foie gras*, Dijon for its gingerbread, and Aï for its sparkling wine; and these reputations, confirmed by a hundred thousand experienced palates, are really well merited.

The superiority of Troyes is so well known and so far spread, that the "traiteurs" of that town, who make the preparation of snails a speciality, export their productions prepared, ready to be put on the fire, not only to all France, but also to foreign countries; moreover, no stranger passing through Troyes in winter ever leaves the town without having tasted at least a dozen of our land-oysters.

The edible snail (*escargot*) is found exclusively on calcareous ground, carbonate of lime being indispensable to it to form its shell. This species constitutes a numerous group, all varieties of which, without being very formidable, are, however, the sworn enemies of our crops, and especially of the productions of our flower and kitchen gardens. Among the numerous species of snail nourished by the soil of Champagne only one is allowed the honour of appearing at our tables; it is the vine-snail (*Helix pomatia*), one of the varieties least hurtful to the crops. It is easily recognised by its shell of dirty white colour, veined with red; it possesses a firm white flesh, and surpasses in size all other kinds in the locality. This snail is to be met with especially in the meadows and brushwoods, in the neighbourhood of rivers and brooks, in the vineyards and in the argillo-calcareous cultivated lands, when a thick crop has preserved in a high degree the natural freshness of soils of this kind. The eatable snail has in the Aube given rise to an important trade, having its principal centres of production in the vicinity of Troyes and in the district of Arcis. The environs of Troyes contribute to the supplies of the town, the trade there being an ancient one. The production in the district of Arcis, which is of later origin, furnishes supplies for exportation, principally for Paris. This commerce, the result of a free trade, has its seat in the least-favoured parts of the country, from which almost fabulous quantities of our "oysters of Champagne" are sent in large cartloads towards the Eastern Railway, destined for the central markets of Paris.—J. BENOIT, in *La Santé Publique.*

[The eating of snails is not confined to France; snails with horse-radish sauce, "schnecken mit kern," form a winter delicacy in Vienna, and are systematically cultivated in the neighbourhood.—M.]

CURES FOR CORYZA.—Dr C. Barbier recommends in this disease that the patient should, if possible, not sneeze at all; if he must sneeze, he must do so with his mouth open, so as not to irritate the nostrils by the gust of air forcibly expelled through them, and also by the removal of the secretion with which they are filled; the patient must, for similar reasons, blow his nose as little as possible, but content himself with drying up the superfluous secretion as gently as possible; and lastly, he must forcibly inhale through the nostrils, a very small pinch of the following powder three or four times a day:—

℞ Argenti nitratis, partem unam;
Sacchara albi, partes novem. Misce optime.

This is said to cure the worst coryza in a couple of days; but its effects are said to be far exceeded by the following prescription, supplied by Dr Zarkowski of Schinznach, three or four inhalations of which taken into each nostril, at intervals of three or four minutes at the very commencement of a coryza, are said to remove it at once, and to prevent all further disagreeable results:—

℞ Extracti opii, gr. 1·5432;
Aquæ distillatæ, gr. 462·96. Solve.

According to the metrical system, the proportion is 10 centigrammes of opium to 30 grammes of water; that is, a trifle less than 1 grain to the ounce. A little of this solution is to be poured into the palm of each hand, and forcibly inhaled into each nostril, the head being at the same time gently thrown back, so that the fluid may pass backwards into the mouth. This is to be repeated as above directed, when all the symptoms will be found to be relieved, *tuto, cito, et jucunde.—Lyon Medical.*

ON THE ACTION OF CHLORAL HYDRAT.—From a review of the third edition of Liebreich's work on this valuable remedy, published last year, we learn that he still bases the action of chloral upon its ultimate conversion into chloroform by the alkalies in the blood, and that in this edition he has worked out this theory with greater scientific precision. Further, he details a case in which an ordinary dose of chloral produced in a gouty patient only violent excitement, and could only be got to act hypnotically after the patient had been for eight days treated with full doses of the bicarbonate of soda. This he ascribes to the highly acid character of the blood in such a case, or, at least, to its defective alkalinity, in consequence of the copious excretion of urate of soda. And he also supports his theory of the action of chloral, by a reference to the readiness with which hypnotism is excited in typhus fever by very small doses, and symptoms of intoxication by only ordinary doses, in consequence of the hyperalkalinity of the blood in such cases. He relates numerous experiments on animals confirmatory of the antagonism between chloral and strychnine, which he was the first to point out; and also expresses a sure hope, based on experimental research, that ere long chloral may be safely employed as an anæsthetic in surgical operations, his experiments having conclusively proved that a very wide difference exists between a fatal dose and one sufficient to produce complete anæsthesia; all that remains to be discovered is therefore the true anæsthetic dose for man. The diseases in which Liebreich has found chloral most useful are senile wakefulness, acute mania, delirium tremens, nervous asthma, chorea, the convulsions of teething children, and sea-sickness. This work, which is published by Müller of Berlin, concludes with a copious reference to all papers on the subject published up to the end of July 1871. —*Berliner Klinische Wochenschrift*, No. 9, 1872.

On Subcutaneous Injection of Ergotine in Varix.—Dr Paul Vogt of Greifswald has recently followed up Langenbeck's experiments on the cure of aneurism by the subcutaneous injection of ergotine, by employing it in varix of the veins of the leg, a disease which surgery has hitherto been only able to palliate. Dr Vogt has made use of this treatment in one case—that of a man aged 60, who for years had laboured under extensive varices of the right leg. A piece of varicose vein, about 2½ inches long, and the thickness of the little finger, running across the tibia, was marked out by caustic, and about two grains of ergotine injected subcutaneously over its central termination, and this injection was repeated every second day. Within eight days this varix had completely disappeared; and even after six weeks' going about in an ordinary manner, no trace of it could either be seen or felt. A second varix, the size of a hazel-nut, lying on the outer side of the calf, was also made to disappear by a single subcutaneous injection of ergotine. In this case, a hard circumscribed tumour remained for some time over the spot where the injection had been made, but neither inflammation nor gangrene resulted, and the swelling gradually disappeared, without having given rise to any pain of importance. The solution employed was one of 2 grammes (30 grs.), in equal parts (7·5 grammes—nearly 2 drs. each) of glycerine and spirits of wine.—*Berliner Klinische Wochenschrift*, No. 10, 1872.

"It is, in truth, as important to the welfare of the patient as of the physician, that the mind of the latter should not be taxed and jaded by excess of work. The weariness of a long day, brought to the bedside of a patient, always impairs, more or less, what the highest professional skill and zeal can minister to his relief. The power of discrimination is lost or lessened, and practice passes too often into a hurried routine, unsatisfactory to the physician, profitless to the patient. This fact, fully confirmed to me by experience, requires neither explanation nor comment. It expresses simply what is the natural and necessary limit of mental power, and the wisdom as well as moral rectitude of acquiescing in it. The physician in full practice, like the lawyer in similar case, pleads the impossibility of contracting his work. There may be loss and difficulty in doing it, but with a strenous intention and a wise regard to the future, it can always be done." . . . . . .
"It—the regulation of life and habits—is a principle of practice often rendered inapplicable by patients themselves; many of whom are better pleased with a bald Latin prescription and the contents of phials and pill-boxes, than with the more simple methods of a well-regulated and wholesome life."—SIR HENRY HOLLAND'S *Recollections of Past Life.*

Part Fifth.

MEDICAL NEWS.

A MEDICAL CONGRESS is to be held at Lyons on the 18th of September next, and seven following days, Sunday the 22d being held as a *dies non*, unless business be brought forward of sufficient importance to necessitate a meeting on that day. The questions proposed for discussion are—I. *Epidemics of Variola*, with the means of arresting them, including an inquiry into the value of different forms of vaccination, and the various police measures which ought to be recommended. II. *Wounds by Firearms*, including the effects of modern projectiles upon the living tissues, the question of explosive balls, and the comparative value of expectancy, amputation, and resection in diaphysal and articular fractures, in regard to mortality and preservation of functions, also the best means of dressing wounds to prevent complications and permit of transport. III. *Ambulances in War-time*, including a comparison between those of different nations, their relations to the military commander, and the difference between a regular and a volunteer service. IV. *On Rinderpest*, comparing it with other epidemics and epizootics, describing the means of its propagation, the best means of arresting its progress, and the sanitary legislation in regard to it in the different countries of Europe. V. *The causes of the Depopulation of France, and the best means of remedying it*, with the object of showing how best to increase the birth-rate, and to diminish infant mortality. VI. *The Treatment of Syphilis*, chiefly in reference to the use of mercury, in all its pros and cons; also as to the use of mineral, especially sulphurous, waters in such cases. VII. *The Reorganization of the Teaching of Medicine and Pharmacy in France.* VIII. *The most practicable means of Ameliorating the Position of the Medical man, and of harmonizing it with the importance of the social duties he is called upon to discharge*, bearing mainly upon the suppression of quackery, and the more equitable regulation of his relation to mutual benefit societies.

Foreign medical men, who are exempt from any pecuniary subscription, ought to intimate their proposed attendance to M. le Docteur Drou, 5 Rue Pizay, à Lyon; and those who intend reading papers on the questions proposed, or on others which they may desire to bring forward, ought to intimate their intention to the secretary, on or before the 10th of September next. One day will be set aside for each question, essays on which will first be read, the discussion will then follow, and after that, if the time permit, independent papers will be read. The time allotted for each essay will be limited; and though the discussions will be public, only members of the Congress will be permitted to take part in the proceedings.

DARWINISM TESTED BY RECENT RESEARCHES IN LANGUAGE.—A paper was read on the above subject at the Victoria Institute, London, on 18th March, by Dr Bateman of Norwich, of which the following is a brief abstract:—The lecturer began by remarking that no works in modern times had exercised so great an influence for good or for evil as the "Origin of Species" and the "Descent of Man," and that no more suitable arena could be selected for discussing Darwinism than the Victoria Institute. Although announcing himself as a decided opponent of Darwinism, he stated his intention of treating the subject fairly, observing that he had no *a priori* objection to raise against it, and that he should not reject it from any fancied notion that its adoption was derogatory to our dignity, or inconsistent with Man's position in the order of nature; he was even prepared to admit that the descent of Man from an ape might not be inconsistent with *natural* religion, but he maintained it was directly opposed to *revealed* religion, which tells us that "God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul." After a brief review of the main features and general purport of the "Descent of Man," and having called attention to Mr Darwin's statement that the difference in mind between Man and the higher animals was one of *degree only, and not of kind*, the lecturer stated that the object of his paper was to show that Man does possess a distinctive attribute, of which not a trace can be found in the ape and lower animals—an attribute of such a nature as to create an immeasurable gulf between the two. This attribute he asserted to be the faculty of Articulate Language, which he maintained to be the difference of *kind* which Mr Darwin was in search of. After stating what he understood by the term language, he proceeded to discuss the question as to whether language was the exclusive prerogative of Man; and having shown there was no analogy between the pantomimic and other forms of expression peculiar to animals and the articulate speech of Man, he asserted that language was our Rubicon, and no brute would dare to pass it. He then entered fully into the question of the Seat of Speech, observing that as the remarkable similarity between the brain of Man and that of the ape could not be disputed, if the seat of human speech could be positively traced to any particular part of the brain, the evolutionist might then say, that although the ape could not speak he possessed the *germs* of that faculty, and that in subsequent generations, by the process of evolution, the speech-centre would become more developed, and the ape would speak—in fact, would become a Man! He showed that none of the various theories as to the seat of language would stand the test of an impartial scrutiny, and he mentioned instances where persons could talk when the presumed seat of speech was invaded by an enormous tumour, completely disorganized by disease, or destroyed by a pistol-shot! With these facts before him, he asked whether speech, like the soul, might not be an attribute the comprehension of which was beyond the limits of our finite minds. Having disclaimed all preconceived hostility to Mr Darwin, he (Dr Bateman) concluded by saying, that if the scalpel of the anatomist had failed to discover a *material* locus habitandi for Man's proud prerogative, the faculty of articulate language—if science had failed to trace speech to a *material centre*, had failed thus to connect matter with mind,—he submitted that speech was the barrier between Man and animals, establishing between them a difference not only of *degree* but of *kind;* whilst the Darwinian analogy between the brain of Man and that of his reputed ancestor (the ape) lost all its force, and the common belief in the Mosaic account of the origin of Man was strengthened. The lecture was illustrated by diagrams.

A LADY doctor who has resigned the profession gives the result of her experience to the New York *Evening Mail:* "If the girls were to know my experience," she says, "not one in ten thousand of them would ever attempt to 'be a doctor;' for I have studied medicine and some branches of surgery, graduated with honour seven years ago, practised for five years, and was successful, so far as restoring my patients and building up a large practice may be considered success; but as for collecting bills and getting fees proportionate to the time and services rendered, I was no more successful than most young practitioners. And though I am now healthy and strong, I could not compete with young men in the medical profession because of inability to bear over-work, and exposure to bad weather, night air, etc. Men who take reasonable care of their health are always well enough to visit a patient; but this is not true of women until they are nearly fifty years old, and never will be true of them, at an earlier stage, while the human race continues. Having almost killed myself, and known two other lady physicians to quite kill themselves by attending to a large medical practice, I have already given up the profession two years since, and will never resume it." The writer thinks even the forlorn hope of authorship preferable to the lancet.

OBITUARY.—WILLIAM HENDERSON, M.D. Ed., F.R.C.P.E., for twenty-seven years Professor of General Pathology in the University of Edinburgh, died there on the 1st ult., after suffering from aneurism of the aorta for rather more than three years, the earlier symptoms of which dated from a long anterior period. Dr Henderson graduated in 1831, and, at an unusually early period of life, was appointed Physician, first to the Fever Hospital, and afterwards to the general wards of the Royal Infirmary, while, before his appointment as Professor, he taught the practice of medicine as an extra-mural lecturer to very large classes, in a most thorough and acceptable manner. An accurate observer, and a clear and forcible thinker, when his judgment was not warped by the acceptance of views in therapeutics at variance with those of his professional brethren, and which time, and the progress of medical science, have more and more conclusively shown to be at variance with medical truth, he early signalized himself by his contributions to medical diagnosis, in a series of clinical studies, on the Diseases of the Heart and Larger Bloodvessels, published in the *Edinburgh Medical and Surgical Journal*, during the years 1835 and 1837. In these he entered somewhat minutely into the signs and symptoms of substernal aneurism, and was the first to point out the occasional occurrence of the murmur of efflux, and to explain its mode of production. He also was the first to point out that unusual delay of the radial pulse was an invariable accompaniment of aortic regurgitation, and an important means of diagnosis in this affection. Rightly to estimate the importance of these observations, it is hardly necessary to throw ourselves backwards into the dim light of those days. Less than two years ago, one of the most distinguished of our modern physicians—now, alas! no more—published a case in a contemporary, in which all the phenomena of a case of aortic regurgitation were reversed, because the cardiac impulse alternated with the pulse, and was therefore believed to be diastolic. While Stokes, therefore, yet believed, and Corrigan had only recently renounced the belief in the ordinary diastolic character of the apex beat, we may readily conceive that no small amount of self-reliance was required to propound the doctrine, that the pulse was naturally posterior to the apex beat, and that unusual delay was a symptom of disease; while the accuracy of the observation has only been confirmed by the advances in our knowledge, made during the thirty-five years that have elapsed since then. Dr Henderson was also the first to point out that typhus and relapsing fevers were two distinct diseases, and not merely asthenic and sthenic types of the same, as was then believed; and the accuracy of this observation has also been subsequently confirmed, and has in no small degree assisted in overthrowing the arguments brought forward in favour of a change of type in disease, and in placing its treatment on a surer basis. In conjunction with Dr John Reid, he also published various observations, which aided in bringing about the recognition of enteric fever as a separate disease—a fact which the labours of Sir William Jenner have since done so much to establish. Besides his early and accurate use of the stethoscope, Dr Henderson also made use of the microscope at a very early period, especially in relation to the pathological histology—as it is now fashionable to term it—of the lung in pneumonia, and of molluscum contagiosum.

In 1842, Dr Henderson was appointed to the chair of General Pathology, as successor to Dr John Thomson; and being already possessed of a reputation second to none for his accuracy of observation and power of diagnosis, he bade fair to attain an eminence in his profession which would have gratified his utmost ambition. Unfortunately, four or five years after this, he became entangled in the sophistries of Homœopathy, and a career, whose early brilliance was so full of hopeful promise, was for ever lost to science. In his new career, Dr Henderson was not unsuccessful, and many excuses might be found for his defection from the ranks of our profession; with the views we hold, however, we believe the kindest thing we can do, is to draw a veil over his later years, and conclude this short notice by expressing our sincere regret, that so talented, so genial, and so lovable a man, should have been led astray by so miserable an *ignis fatuus* as Hahnemannism.

THE DRAINAGE OF SCARBOROUGH.—We have received from Dr Taylor, the medical officer of health, a Report from the Special Sanitary Commission, and one from Mr Bazalgette, the eminent engineer. These evince a most praiseworthy desire for the sanitary improvement of the town, though they certainly do not show that its sanitary arrangements have hitherto been perfect. With our own frightful mortality from causes hitherto regarded as preventible, we are certainly not prepared to throw stones at our neighbours, but rather to suggest the propriety of our civic authorities setting our own house in order, by taking a hint from the Scarborough reports.

SMALLPOX.—During March the epidemic continued as fatal in Edinburgh as formerly; during April, however, it has been somewhat abating, and in the week ending 13th April, the deaths were only seventeen, against twenty during the previous week.

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Part First.

ORIGINAL COMMUNICATIONS.

ARTICLE I.—*Some of the Medico-Legal Relations of Insanity to Will-making.* By ARTHUR MITCHELL, M.D., F.R.S.E., Commissioner in Lunacy for Scotland.

IN this paper the medico-legal relations of imbecility, or weak-mindedness, to will-making are discussed.

It is justly remarked by Ray that "no cases subjected to legal inquiry are more calculated to puzzle the understandings of courts and juries, to mock the wisdom of the learned, and baffle the acuteness of the shrewd, than those connected with questions of imbecility."

It is extremely difficult to say who the imbecile are. And even after we have come to some sort of agreement or understanding as to who they are, it is scarcely less difficult to determine to what immunities they are entitled, or what disabilities should be imposed on them.

Nor should the existence of these difficulties be a matter of surprise. For, if it be true that there exists every conceivable gradation between the utter mindlessness of deep idiocy and the majesty of the perfect mind, the region of imbecility, which lies midway, will almost certainly have indefinite and shifting boundaries; and being thus an intermediate state, we may confidently expect that it will sometimes be doubtful whether the incapacities and immunities of the one end, or the capacities and responsibilities of the other should be attached to it.

"It is impossible," Georget says, "to fix the limits which separate imbeciles from men endowed with faculties sufficient for understanding the whole breadth of their social obligations. Reason is modified and lost by insensible degrees; by an infinitude of steps we rise from the most complete idiocy to the most perfect development of the mental faculties."

Neither science nor law can remove these difficulties. They are inseparable from all questions which relate to mere imbecility.

A denial of them, in a positive and dogmative way, may safely be regarded as an evidence of ignorance, or of narrow and exclusive views. They are felt, indeed, by the most expert of experts as much as by any, and they are sure to be always, and freely, expressed by the really well informed.

We shall easily satisfy ourselves as to the accuracy of these opinions, if we make an effort to ascertain who the imbecile are, and to show how the law deals with them.

In attempting to determine who the imbecile are, I have to point out on the threshold, that imbecility and idiocy are practically associated as mere varieties of the same thing—imbecility representing the milder forms and degrees of idiocy. I am alluding now to the way in which medical men regard imbecility. It is with them just a mild form or degree of idiocy. This being the case, I need scarcely add that there exist persons whom one medical man would call idiots, and another imbeciles. Nay, more, it is within my knowledge that the same medical men, considering themselves very expert in such matters, have frequently called the same persons at one time idiots, and at another time imbeciles. Imbecility, therefore, in the tabular statements of medical men, is a mild degree of idiocy, and there is no sharp line separating the one state from the other.

They are both usually regarded as congenital states, but this is a mistake, for in a very large number of cases they date from infancy or childhood, and not from intra-uterine life. They are still, however, even when not strictly congenital, states of mental *privation,* rather than states of *deprivation*—of amentia rather than of dementia; for the reason that, as little mental progress or growth has been made, there is little to lose or be deprived of, when disease of the brain appears in infancy and leaves those permanent effects, which are often undistinguishable, both physically and psychically, from the effects of nutritional or developmental misfortunes occurring in uterine life.

It is of some importance not to lose sight of this view of imbecility, because it regulates the tabulation of cases in statistics prepared for medical purposes. It will be observed, that it rests not simply on a state of mind, but on a state of mind with a certain history or origin—that is, it makes imbecility not simply a want of mind, but a want of mind which dates from uterine life or from infancy.

But this history or origin is of no value whatever in a legal inquiry. We have to do, there, only with the state of the mind. If the mental powers are wanting, or are weak and feeble, it matters nothing how or when the want or the feebleness came, in a question, for instance, which concerns testamentary capacity. The existence of the feebleness and its extent are, in such a case, the points to be determined.

Accordingly, the imbecility of lawyers includes more than that of medical men, and the mildly demented are as much imbeciles in courts of law as the mildly amented. The imbeciles of medicine were always imbeciles, but the imbeciles of law may at one time have been strong-minded men. Nor does it matter whether the dementia—that is, the loss of mental power by those who once had it, or, in other words, the acquired imbecility—has followed mania, or fever, or drinking, or masturbation, or melancholia, or sunstroke, or a blow on the head, or anything else.

That there is nothing far wrong in the greater width which the law gives to imbecility, is proved by the fact that regarding many of the demented—those, namely, who have had normal minds rendered abnormal and feeble by disease—the most skilful of medical men cannot tell, from anything about the mental state, whether the condition does or does not date from uterine life or infancy, *so long as the patient's history is unrevealed.*

In both of these states—the congenital and the acquired imbecility—there is implied something more than the mere absence of knowledge, and it is of importance to remember this. There is implied in them the absence of a power to acquire or to possess knowledge, and it is this which gives to them the colour of a diseased condition. They exhibit, in other words, an ignorance which cannot be wholly overcome.

There is, however, one state of mind which is treated by the law as a state of imbecility, of which this is not entirely true. I refer to the mental condition of childhood, on which the immunities and incapacities of imbecility are conferred, though there is no evidence of any inability to acquire knowledge. On the contrary, every day is then giving evidence of the reverse. In the case of children, the law *appears* to confer the incapacities of imbecility on the mere absence of knowledge; but a sound view underlies this procedure of the law, for it is properly assumed that, though the power to acquire knowledge exists and grows as it is exercised, there has not been sufficient time given to the operation of the power to make it possible for the child to have acquired or to possess what is involved in testamentary capacity. We have here, therefore, merely another form of *inability*—not, it is true, inability to acquire, but inability to possess. The undeveloped mind of childhood, however, is thus practically regarded as a state of imbecility, though it is not called by that name either in legal or in medical writings. Farther reference will be made to this subject; but, before leaving it, I beg to call attention to the good that results from looking at states of insanity as often as we can in the light which is cast on them by conditions which are not called insanity, but which are nevertheless in a neighbourly alliance.

The untrained and uneducated mind, though in many respects like the mind of infancy, is not so in all respects. With the arrival of manhood and womanhood the mind cannot help acquiring certain powers and qualities; and its organ, whether it be cultivated or neglected, goes on in a certain sense to maturity. There may exist a profound and dismal ignorance, which neither medicine nor law will consent to call imbecility. Yet it is well known both to doctors and to lawyers that there is an ignorance—the result of utter neglect, and coexisting with a capacity to acquire—which it would perhaps be a humane, if not rather a just thing, to treat as the equal of mental unsoundness, in so far as regards immunities and incapacities. Expediency, or the claims of society—not science or humanity—determine that it shall not be so.

When the wisdom of discharging its duties is fully recognised by society, and no member of it is left without a sound and suitable education, then the occasion for exacting this claim will have ceased to arise. In the meantime, society will go on protecting itself by punishing those whom it has neglected, finding its justification in nothing higher than views of expediency.

We have nothing to do at present, however, with the extent to which freedom from responsibility is or should be conferred on the imbecile. Different considerations determine that point from those which determine the question now before us. Civil incapacity and freedom from punishment for crime, do not necessarily go together. It is with the first alone that we are here dealing, and even with the first only in reference to a particular act, namely, that of will-making.

We have seen that for medico-legal purposes imbecility is a state of feeble-mindedness, whatever be its origin or history; and we shall now endeavour to show the extent and kind of imbecility which may take away or may leave the power of executing a valid will. "It is impossible, however, to specify any particular rules for ascertaining the mental capacity of imbecile persons; for circumstances, always proper to be taken into the account, are constantly varying with each individual case;" and it is in the dealings of the law itself with the subject that we find the best indications of the measure and kind of feeble-mindedness which destroy testability. Science cannot lay down definitions or boundaries in this matter which would be accepted by law, for no such definitions or boundaries exist, and each case must be judged of by itself, on its own merits, and in the light of all the circumstances. But, nevertheless, some general principles do evolve themselves from an examination of the subject, and these are useful as guides. It will be the aim of what follows to disclose these, and to show that, as a rule, a fair decision is attainable in disputed will cases, where the question hangs on the mere mental imbecility of the testator.

It will be useful at this point to recall two aspects of the position which a will occupies in the eye of the law.

The first of these is that the right to make a will is one which the law jealously guards, and which it refuses to set aside on frivolous pretences. In this respect the law expresses the general desire of the community, by whom the right to regulate the disposal of property after death is much valued, and to whom there is comfort and advantage in the knowledge that it is not an easy thing to take it away.

The second point in the law's relations to will-making, which I think it useful to recall, is that a great degree of intelligence is not held to be necessary to the possession of testamentary capacity. To give instructions for the drawing out of a will is not thought to require high mental powers. It is regarded rather in the light of a simple transaction, and persons are held to be sufficient for it who might be unable to carry out other transactions in a sensible and efficient manner. For instance, it is regarded as a simpler transaction than the buying and selling of shares, the making of investments, the carrying on of a business, etc.; and it would not prove a man to be incapable of making a valid will that he had been found to break down in such matters from weak-mindedness.

These two points—viz., the manner in which the law guards the right to regulate the disposal of property after death, and the view it takes as to the simplicity of the transaction—should never be lost sight of in considering the medico-legal relations of unsoundness of mind, whatever its form be, to will-making.

We are dealing just now with that form of mental unsoundness which is called imbecility, and which was shown to be a mild form of idiocy. Of those mental states of which imbecility is the mild expression, we are not speaking. They certainly deprive a man of the power of making a valid will.

But, as Shelford says, "although *an idiot* is incapable of making a will, yet he that is only of a mean capacity or understanding, or one who is, as it were, between a man of ordinary capacity and an idiot, is not prohibited from making a will or testament, if he has sufficient understanding to comprehend its nature and effect."

That Shelford is correct in stating this as the law, is proved by an examination of the important judicial decisions in such cases; but it is easy to see that when a testator admittedly stands *somewhere between an ordinary man and an idiot,* doubts may arise as to whether he does not stand a little nearer to the idiot than to the ordinary man, and it is easy to see that some may think him near enough to the idiot to be an idiot, while others may declare him far enough away to have testamentary capacity. Such doubts and difficulties lead necessarily to efforts to estimate or measure the mental capacity of the individual testator whose will is in dispute. And "the doubtful and uncertain point at which reason disappears, and at which incapacity becomes evident and manifest, can only be ascertained by an examination of the particular circumstances of each individual case requiring decision." In such cases, it is a question of fact which has to be tried. Lord President Inglis, in Morrison *v.* Maclean's Trustees, soundly said to the jury,—"Capacity or incapacity to make a will is a question of fact, and is not, primarily at least, either a question of law or a question of medical science." "In some cases," he added, "there are rules of law requiring to be alluded to in trying that question of fact, and in almost all cases medical science will be able to give some light to guide us in judging of the facts."

In the case of Ingram *v.* Wyatt, Sir John Nicholl delivered a judgment of great value, containing much that is pertinent to our subject.

He proceeds to consider carefully what is meant by "imbecility of mind"—what are its marks and characters—and he says, "In order to arrive at the true meaning of *imbecility of mind*, we may resort to what the law describes as perfect capacity." "The averment," he says, "to be contained in a common *condidit* is, that the testator was 'of sound mind, memory, and understanding—talked and discoursed rationally and sensibly, and was fully capable of any rational act requiring thought, judgment, and reflection.' Here is the legal standard. When all this can be predicated of the person, bare execution is sufficient; but if it cannot be truly predicated, a deficiency of capacity exists—a deficiency not necessarily rendering the person intestable, but, in proportion to the degree of deficiency, requiring clearer and more direct proof of the unbiassed testamentary intention. Imbecility and weakness of mind may exist in different degrees between the limits of absolute idiocy on the one hand, and of perfect capacity on the other. When the law uses the terms 'mind, memory, understanding, thought, judgment, reflection,' it must not be supposed that they are quite synonymous. By no means; they are separate faculties, though nearly connected with and graduating into each other; and one or more of these faculties may be defective in a greater or less degree, while the others remain perfect in the same individual."

"For example, the memory is sometimes perfect where higher powers of the understanding are greatly defective. When imbecility is original—or, as medical authorities express it, connate—the memory is often perfect, especially of trifling and and simple circumstances, though the other mental powers remain infantine." "In such an individual the understanding has made little progress with years—it has not matured and ripened in the usual manner; yet, even in such individuals, unless the imbecility be extreme, some improvement will have taken place—some progress in knowledge beyond mere infancy will have been made; by the help of memory, by imitation, by habit, such an individual will acquire many ideas—will recollect facts, and circumstances, and places, and hackneyed quotations from books—will conduct himself orderly and mannerly—will make a few rational remarks on familiar and trite subjects—may retain self-dominion, and spend his own little income in providing for his wants, as a boy spends his pocket-money; and yet may labour under great infirmity of mind, and be very liable to fraud and imposition."

"The principal marks and features of imbecility," he goes on to say, "are the same which belong to childhood—of course varying in degree in different individuals:—frivolous pursuits, fondness for and stress upon trifles, inertness of mind, paucity of ideas, shyness, timidity, submission to control, acquiescence under influence, and the like."

This is a lawyer's view of what is meant by inbecility; and I question very much if a better view of it is to be found in the writings of medical men. No one, perhaps, has taken more trouble in attempting to define it than Hoffbauer, but his minute account of the six divisions of idiots and imbeciles is drawn from the depths of his own inner consciousness, and not from observation, and it serves no useful practical purpose. Medical men need not much object to the legal view of what imbecility is; but it is clear that it describes a state which varies so much—up and down, and to the right and left—that in each individual case it will be necessary to ascertain the extent and character of the mental deficiency, in order satisfactorily to determine whether it does or does not destroy the testamentary capacity.

Nothing, however, can be more dangerous or unwise than to assert that a person should be deprived of all his civil rights because he cannot do some particular thing, or because he does do some particular thing, or does hold some particular opinion. Bucknill made more than one error of this kind in his evidence in Morrison *v.* M'Lean's Trustees, as the presiding judge pointed out to the jury. Haslam, again, simply talks nonsense when he says that, "If a person were capable of enumerating progressively to the number *ten*, and knew the force and value of the separate units, he would be fully competent to the management of property. If he could comprehend that twice two composed four, he could find no difficulty in understanding that twice ten constituted twenty." Why, I ask, is he to draw the line at *ten?* Where would such reasoning end? If a man certainly knows that twice ten make twenty, because he knows that twice two make four; may we not go further, and say that, because he knows that twice ten make twenty, he as certainly knows that twice twenty make forty, and so on? But observation tells us that very often this is not true. Definite tests and strong assertions of this kind are extremely unsafe, yet able men are often tempted to use them. Even Casper, ceasing for the moment to be judicial and cautious, says that "a man who knows the year in which he was born and the current year, but who cannot tell his own age, is not in a position to look after his property himself, or to undertake any office or employment." It would be very easy indeed to find actual cases to disprove this and all similar assertions.

"Imbecility," as Sir John Nicholl says, "is a matter of degree, but the degree of weakness differs" (not only in different individuals, but) "in the same individual under different circumstances, and according to the different situations in which he is placed at one time or another of his life." In fact, the testator's whole history may have to be considered—all the circumstances of his life—his education, upbringing, associates, pursuits, etc.; and even then, in the light of every fact which can be brought forward, it may be difficult in some cases to say whether capacity should be conferred or withheld; and the most expert of medical men will by no means be free from such doubts.

It may be useful if I give some account of the state of mind of the testator, in the case which led to the judgment from which I have quoted, since Sir John Nicholl considered that his testability had not been upset, though his will itself was upset—on the ground that the circumstances under which it was executed, as well as its provisions, strongly inferred fraud and circumvention, but not on the ground that it was impossible for the testator to have made a valid will.

This man, then, whom Sir John Nicholl thought testable, was described by the witnesses—I take my account of him from Sir John Nicholl's judgment in the case—as foolish, out of his mind, filthy in his bedroom, disgusting at his meals, insulting people in the streets, hallooed after by boys, calling out continually *yehep yehep*, of eccentric manners, reserved, shy, frivolous, saying the same sort of things over and over again, slovenly in his dress, indolent, averse to exertion, penurious, etc. All this was *admitted* to be true, or nearly so; but, on the other hand, it was held that his conduct in the management of his small income, and his letters to his brother and sister, showed that he was aware (in some degree) of his rights; that he comprehended some matters respecting his property; that he knew how to spend his money with prudence; that he recognised the claims of his kindred; and that he had formed and expressed an intention to make a reasonable and sensible will.

The judge held it proved "that he was a weak man; that, judging both from what he did and from what he omitted to do, his understanding was much below par, and the legal standard of perfect capacity; that inertness, inactivity, indolence, torpidity of mind, inattention to his large property, were the leading characteristics of his weakness; that he was, therefore (to take it no higher), a person so far liable to be imposed upon as to require the Court to look with vigilance and jealousy into the proofs of the *factum;* but that he might possess a testable capacity; and that strong and clear evidence of the *factum*, and of free and active testamentary intention, might establish the executor's case," and the validity of his will. In other words, though this weak-minded man—this imbecile—left nearly his whole property to the son of his own agent, an attorney, not related to him, and in whose house he lived, and left nothing to his sister or to any relative, yet his will might have been held valid, if direct proof could have been adduced that he understood, and freely intended to make that disposition of his property which was embodied in it. His will was not held to be invalid because he was an imbecile, but because fraud and circumvention had been practised on him. Yet the imbecility in his case was not by any means very slight. On the contrary, there could be no doubt that the man laboured under considerable unsoundness and defect of mind. But the judge pointed out that the evidence may prove an imbecile to be testable without establishing such "complete understanding and perfect capacity that a mere bare act of execution shall infer full knowledge of the nature and contents." Hence it is, when the testamentary capacity of an imbecile or weak-minded person is questioned, that very frequently the point eventually turns not so strictly on the capacity of the testator as on his freedom from imposition or undue influence. In order to be held valid, the will of an alleged imbecile must be the unbiassed and free expression of his own purpose and desire. In other words, he may have testamentary capacity, but not the capacity to resist undue influence; and, in proportion to the degree of the mental deficiency, the law requires "clearer and more direct proof of the unbiassed testamentary intention." This just means, that the law may give effect to the wishes of a weak-minded man as to the disposal of his property after death, provided it is clear that they were really his own wishes; but if it be shown that he had been subjected to imposition or to undue and improper influence in the matter of the will, then his weakness of mind may in that way invalidate it.

I do not feel able to show that this procedure of the law rests on any very scientific principle; but, nevertheless, I think that common-sense will give it approval. It is a fact, I believe, that there are men of weak understanding, who, if left to themselves, could and would express wishes regarding the disposal of their property which would be rational and sensible, and which would properly recognise the varying claims of kinship and friendship, yet who are of so facile and yielding a character, in consequence of that same mental weakness, as to be easily imposed on, and overruled into expressing wishes which are not really their own. This, indeed, is only another aspect of that *relational* insanity to which I have so often alluded in these papers,—"Quoad hoc vel illud insanire," or "quoad omnia insanire,"—to be capable of this and incapable of that—to be trustworthy here and the reverse there—or to be incapable in every matter.

I am quite aware that there are some who think the doctrine of relational insanity a very unsound one; but, nevertheless, I hold it to be good doctrine, and one which cannot be overtaught. To say that men are relationally insane, is, in reality, the same thing as to say that they are relationally sane, which last all admit, for it is certainly true that some sane men are competent in affairs in which others prove themselves incompetent. "A person," as Haslam says, "might be able to manage duly a small income who would be inadequate to the distribution of a large revenue; a man might be competent to keep a shop who would become overwhelmed and distracted in the learned professions; a country squire might gallop hospitably through life, without being able to discharge his duty as a magistrate."

Whatever may be thought or said as to what is scientific, it is at any rate a fact, that the existence of this *relational* insanity is fully recognised by the law; and we have an instructive illustration of this recognition in its dealings with children. Thus, a child cannot make a will till he has reached the age of puberty; but, even then, he can only make a will which is valid when it relates solely to movables. He cannot regulate by will the disposal of land: he must be a major, or twenty-one years old, before he can do that. He may sell the land and dispose by will of its price; but, if the land is his when he dies, the law, and not his wishes, will regulate its destination. In other words, it would appear that, in law, there is mind enough at puberty to dispose by will of money, but not mind enough to dispose by will of land. Between the age of puberty and twenty-one, he can enter into scores of contracts by which he will be legally bound; he can marry and beget legitimate children; he can go into business and make money, and buy and sell houses and lands; but he cannot regulate the disposal of any heritable property after his death. There are other things also which he cannot do till he is twenty-one years old. He cannot, for instance, vote for a member of Parliament, or even for a Town-councillor; nay, more than this, even though he be a Cabinet minister, he cannot be appointed tutor-at-law to a lunatic till he is twenty-five. These capacities and incapacities are, of course, resolved on by our legislators with some reference to the mental state or maturity of young persons. The whole question indeed is one of immature and mature minds, of weak-mindedness and strong-mindedness, of sufficient and insufficient understanding, of facility, etc., etc.

All this looks very arbitrary. I do not know that medical men were consulted about the fixing of the ages at which the growing mind becomes sufficient for this or for that; or that the laymen, who framed the laws, thought that their own observation did not make them quite competent to judge of the matter without professional assistance; but it is probable, I think, that the ordinary observation of ordinary men fixed these times; and, if we may judge by the general acquiescence in them, they are approved by the common-sense of the community, and are quietly regarded as, in the main, conducive to the wellbeing and convenience of society.

Notwithstanding this, however, we all know very well that hosts of men at nineteen or twenty are much better able to vote for a member of Parliament than others at twenty-one, and that they could quite as sensibly and rationally dispose by will of their lands as of their furniture or money. Nor, I confess, can we easily see why a man should be allowed to marry and have legitimate children, while he still labours under a certain measure of testamentary incapacity, and is regarded as unfit to vote even in the election of a Town-councillor. Then, may there not be reasonable doubtings as to whether a girl has really the capacity to dispose rationally of her property at an earlier age than a boy, and why, if puberty be the time when that capacity is established, a particular age is fixed, and not the actual arrival of puberty, which comes really at different ages, in different persons, and which, in Shetland for instance, comes systematically at an age later, perhaps, than the one laid down by law?

I could not possibly have found a more apt and telling illustration than this of a relational sanity, or a relational maturity, or a relational imbecility, for the mental state in question may be properly described in any of these ways.

The lesson, however, which I desire to bring out of this peculiar dealing of the law with the imperfect mind of childhood, is this:—It indicates that some at least of the relations of law to unsoundness of mind, are determined by considerations affecting the convenience and good of society, and are not settled on strictly scientific principles. It should never be forgotten by medical men, who are witnesses in, medico-legal inquiries, that this is the case. The law does not affect to dispense the ideal justice of the psychologist and physiologist; and medical testimony would have more weight in courts of law than is sometimes given to it, if this consideration was kept more steadily in view, and if it were remembered that much of the inconsistency which pervades the relations of law to insanity, is the result of a consistency in consulting the public weal and public convenience. It will be long, I fear, before the law will be able to act otherwise.

We come now to a point of special importance in the medico-legal relations of will-making to imbecility.

It has been already shown, that whenever the validity of a will is questioned on the ground that the testator was of unsound mind, the nature and character of the will itself must be carefully considered, and must influence the conclusion at which we arrive. But in no cases should the character of the will receive more attention than in those in which it is alleged that the incapacity resulted from mere imbecility; because in no cases is it more likely to reflect the testator's state of mind.

"The presumption of law," Shelford says, "is against the validity of all the legal acts of an idiot; but if it be shown that a rational will proceeded from, and was dictated by, a person commonly reputed to be an idiot, it would be strong evidence to prove that he was not so." This is what the law says. Medical science would, I think, go further, and say that such a will would absolutely prove that, though reputedly an idiot, he was not so in fact, and that a mistake had been made in calling him an idiot, for a will really proceeding from an idiot would inevitably disclose his idiocy.

In like manner, a rational will, truly proceeding from, and dictated by, a person reputedly an imbecile, should go a great way to show that his imbecility was slight or doubtful, and that his testamentary capacity should be acknowledged. "We are acquainted with the mind," as Haslam says, "from the phenomena it displays. By discourse and conduct we infer its soundness—by the same evidences its unsoundness must be detected." Imbecility is a matter of degree, and we judge of the degree by what the imbecile does and says. There may be a great deal about him *sounding to folly*, and much manifest infirmity of mind; yet when we learn that he can thin turnips, or knit a stocking, or be sent to town with half-a-dozen messages, we know that there is reason and memory about him sufficient for these simple transactions. In these matters, then, we pronounce him *not incapable*, because we find him capable of doing them rationally and correctly. We gauge his mental power by its products. What else can we do? So, also, if his will is the production of his unaided and uninfluenced intellect, and if it be rational and sensible in its provisions, it is entitled to some consideration and respect, as indicating the existence of a power to act rationally in that matter. There should, however, be no inflexible rule, and each case should be considered and settled separately, and on its own merits; but the consideration of the question should be approached with these views and in this spirit. Of the soundness of the opinions I am enunciating, I think all will be convinced who reflect on the way in which the contrary views might affect the wills of many old persons who display some loss of memory, childishness, and mental torpidity—who are, in fact, imbecile to a certain extent, but who nevertheless know sufficiently well what a will means, what property they have to dispose of, and who those are who have claims on them, and can take all these things into consideration when framing their wills.

So much, then, for the rational wills of imbecile persons. But let us look now at the other side. What should be the effect on the validity of the will of a reputed imbecile if it is irrational or unnatural? I use here the two words—irrational and unnatural—because imbecility involves the affections as well as the intellect.

When such a will is questioned, it will generally, I think, be safe and just to upset it, and I would not object much to convert the word *generally* into *always.* If a rational will is evidence of understanding—of a disposing mind—*a fortiori*, an irrational one is evidence of the reverse. In saying this, it must be remembered that I have special reference here to the state of mind called imbecility. When we discussed delusional insanity, and its influence on will-making, it was pointed out that if the delusion itself appears in the will, and influences its provisions, both doctors and lawyers are agreed that the will should thereby be rendered invalid; in such a case, the will, in fact, mirrors the insanity. The delusion of the delusionist is seen in it, and that settles the matter.

Should it not give a like settlement to the matter when the folly of a fool is mirrored in his foolish will?

Of course, the question will arise as to what is rational and what is foolish in a will; but I am assuming that the provisions are admittedly rational or admittedly foolish, and I then ask what effects these characters of the will should have on its validity, the testator being an imbecile? I have given it as my opinion, that the rationality of the deed should strongly support its validity; and, on the other hand, I think that if it be irrational, silly, stupid, foolish, and unnatural, this fact should much more strongly support its invalidity.

It is conceivable that a very infirm mind might give forth a sensible and rational will by a sort of chance. If, for instance, the owner of such a mind has lived amidst healthy, moral, and intellectual surroundings, he will have been silently imbued with rational and right-minded notions on this subject; and when he expresses his wishes regarding the final disposal of his property, such wishes may, in strict reality, not be his own so much as the wishes of others. He has been influenced, in fact, unintentionally and educationally, though not, in the eye of the law, improperly. He might give rational and natural instructions for the framing of his will almost parrot-like, as he would repeat the Lord's Prayer or the Shorter Catechism. Such a chance rationality of a will is at least conceivable.

But it can be the result of no such chance when a reputed imbecile makes an irrational, unnatural, or foolish will; and there will very seldom be any practical unfairness in concluding that these qualities of the will were also qualities of the mind from which it proceeded, and that they afford strong evidence of incapacity. It is difficult, indeed, to see why the delusion of a delusionist should upset a will when it appears in it, and not the folly of a fool—or the imbecility of an imbecile—when they make a like appearance. That the foolish wills of fools should stand, cannot, I think, be either for their own advantage, or for the good of society.

ARTICLE II.—*On the Use of the Bowl during Delivery.* By J. MATTHEWS DUNCAN, M.D.

(*Read before the Obstetrical Society of Edinburgh*, 10*th April.*)

THE practice which I wish in this paper to insist upon appears to me valuable and highly important; yet, assuredly, it is a very humble matter, not astonishing by its novelty or its boldness, nor founded on any profound scientific induction. A bowl, to be kept adpressed to the hips if the woman lies on her back, to the upper and posterior part of the thigh if she lies on her side, in order to catch discharge of any kind which may come from the vulva.

Such a bowl I have used for many years in my ordinary management of labour, and I have so high an opinion of its utility that I now solemnly describe it and its application.

The bowl may be made specially for the purpose; or an ordinary small wash-hand or sponge basin, or a kitchen bowl, may be used. The last is not so good as the others, as such are generally too deep and not wide enough. The edge of the bowl touching the soft parts should be without sharpness, and smooth or flat. The bowl should be capable of containing two pints. It is advantageous to have two of them at hand, the one replacing the other when full.

Such a bowl is used at any or at all times during the various stages of labour—to receive accidental or unavoidable hæmorrhage; to receive liquor amnii gushing away or more slowly draining; to receive the liquor amnii discharged after the birth of the child; to receive the placenta; to receive postpartum hæmorrhage.

The ordinary method of conducting labour is to receive all such discharges in cloths—a method which I regard as very objectionable, and this character of it is demonstrated by the following arguments.

The bowl is preferable to the use of cloths because it is a cleaner plan. This advantage requires no proof, for it is plain that receiving discharges in an earthenware vessel and removing them in it from the bed of the lying-in woman must be incomparably cleaner than allowing them to run into and soak cloths, and soil the bed-linen and the clothes and person of the patient.

The bowl is preferable to the use of cloths because it is less expensive. The quantity of cloths frequently required when a bowl is not used, is very great. In questions of practice, such as that now under discussion, it is chiefly the circumstances of the poor that have to be considered; and it is impossible for a poor household or one of moderate means to provide the quantity of cloths necessary for the proper management of a labour. In proportion as the quantity of cloths required is great in these circumstances, so also is great the mismanagement of the case; the mismanagement resulting not only in want of comfort, but also in disease and death. The poor form the great majority of our patients, and cannot afford money to provide a supply of cloths adequate to the requirements of an ordinary labour. The use of the bowl diminishes to a very large extent the quantity of cloths used.

The use of the bowl is preferable to the use of cloths, because it promotes the salubrity of the surroundings of the patient by keeping off injurious damp and cold. Dampness and coldness go very much together in the circumstances under consideration. Both are not merely destructive of comfort, but are injurious, as promoting disease directly and indirectly. The evil may be incurred directly, for every one knows the dangerous action of cold during and after delivery. Nowadays, with our better though lamentably imperfect knowledge of the diseases called collectively puerperal fever, we are not disposed to ascribe so much evil to cold as was formerly done, but there can be no doubt of its injurious potency. In the times referred to flourished the great William Hunter, and it is well known that he regarded injudicious exposure to cold as the chief cause of the disasters which befall women in childbed. But dampness may be very injurious in other ways, for it encourages decomposition and putrefaction. Liquor amnii, blood, meconium, are all full of or composed of materials which are ready to decay or putrefy; whose incomplete removal, therefore, from the bed of the lying-in woman will lead to her being enveloped in an atmosphere full of noxious germs and other baneful products of decomposing animal matters. The use of the bowl facilitates the complete removal of everything that is damp about the newly-confined woman.

The use of the bowl is preferable to the use of cloths, because it enables the practitioner to form a better judgment of the quality and quantity of discharges. This is evident enough at once. But the very great advantage of knowing accurately the quantity of blood discharged in cases of hæmorrhage is too important to be passed over without being insisted upon. Nothing can exceed the vagueness of the ideas of practitioners in most cases as to the quantity of blood lost; and while it is, no doubt, supremely important to judge of the graveness of a flooding not merely by the quantity discharged, but by the effects of the loss on the constitution, as indicated by the symptoms, yet there can be no doubt of the very great value of information as to quantity in every case. In many cases indeed, such as those where constitutional symptoms are slight or absent, the ascertainment of quantity exactly is of primary importance, but ordinarily it is not so.

On these grounds, I strongly recommend the use of the bowl in the conduct of every case of labour. Restlessness on the part of the patient may diminish, nothing can destroy, its utility.

It is well known that the use of the bowl in cases of recent confinement has been recommended, and especially in cases of post-partum hæmorrhage, with objects in view quite different from those simple and homely uses which alone are the subject of this paper.

ARTICLE III.—*The Use of Barnes's Dilators in the Treatment of Complete Placenta Prævia. With two Illustrative Cases.* By ANGUS MACDONALD, M.D.

(*Read before the Obstetrical Society of Edinburgh, 24th April.*)

THE record of the two following cases has been delayed, because I had expected to have met with some fresh cases, to collect and communicate along with the present. But though I have now waited for nearly twelve months, I have not been sufficiently fortunate to meet with a single case of placenta prævia, either in connexion with the New Town Dispensary or in my own practice. I therefore ultimately resolved to bring the present cases before you, in the hope that in the event of some more occurring, a new opportunity of communicating them would be granted.

Now, there can be no doubt, that of all the accidents that accompany parturition, there is not one which exceeds placenta prævia, either in importance or in danger, when this happens to be complete; and there is no complication which tasks more severely the presence of mind, or the steadiness of hand and head of the accoucheur. When one finds his hand passing alongside or through a roof formed of gushing vessels, which, in extent and amount, as they close in the pelvis, always remind me of the roof of a huge cavern, it needs all one's self-possession to maintain a cool head and an active hand. And scarcely can one imagine circumstances more urgently requiring these concomitant conditions. The life-blood of a fond mother and faithful wife, so loved and loving, on whose life and health so many important interests hang, is streaming from her; and the obstetrician feels, that upon the skill and promptitude with which he effects delivery, the happiness and misery of so many hearts depend. Nothing but the conviction that the practitioner has done the very best that the present state of the science and art of obstetrics teach him to do for his patient, can enable him, with a quiet conscience, to meet failure under such circumstances. Any contribution, therefore, which tends to place the practice in such cases upon a safer or surer basis, both in respect to mother or child, or both, is, in the interests of humanity, at least entitled to a patient hearing. In my remarks regarding the treatment of the following cases, I profess to bring forward nothing original. The treatment adopted is that which I understand is followed by Dr J. M. Duncan in his own practice, and to him indeed I owe the first suggestion of it. It is also recommended and practised largely, both at home and abroad, by other accoucheurs. For example, I find it recommended, among other methods, in Schroeder's Text-Book of Midwifery, one of the latest works published in Germany upon obstetrics. All I want to effect is, to direct the attention of practitioners to the great ease, rapidity, and safety, with which the cervix, involved though it may be completely by a large placenta, may be dilated to any amount by Barnes's dilators. In using the term Barnes's dilators, I do not in the very least mean to prejudice the claims of a distinguished member of this Society, Dr Keiller, to their invention. I simply use the term as expressive of the fiddle-shaped indiarubber dilators, which, rightly or wrongly, have yet somehow got associated with the name of Dr Barnes. Premising with these remarks, I proceed to the record of the cases.

Case I.—Mrs D., æt. thirty-seven, and residing at Pitt Street, Edinburgh, had been thirteen years married, and had given birth to seven children, without any unusual occurrence. But on the 20th of May 1871, she observed some bleeding proceeding from her vagina. As near as she could calculate, she was then about seven and a half months gone in pregnancy. The bleeding continued at intervals till the 31st day of May, when she consulted Dr Archibald Dickson, who, after seeing her, referred her to my care. On vaginal examination, evidence was obtained that we had to deal with an undoubted case of placenta prævia, as also, that the amount of hæmorrhage was already considerable, and was beginning to tell upon the patient's strength. Her material surroundings were also of the meanest description, and ill suited to support her under trying circumstances.

My pupil, Mr John Playfair, kindly took the general oversight of the case. We saw her several times during this day and the next; the bleeding continued at intervals the whole time; and during the day of the 1st of June, the patient thought she felt slight labour-pains. In the evening of this day (1st June), feeling assured that, if the hæmorrhage, which was now copious, were allowed to go on, it would speedily exhaust the patient's strength, I resolved to dilate the cervix and effect delivery, as now we had reason to believe, so far as the mother's calculations could guide us, that she was close upon, if not actually at the end of, the eighth month.

Mr Playfair, two other medical friends, and myself, then went to the patient's house about 8 o'clock P.M., when we proceeded, after making some preliminary arrangements, to effect delivery. As the os had by this time begun partially to dilate, I first endeavoured to introduce within it No. 2 of Barnes's set, and after some difficulty succeeded. After being well distended, the dilator was allowed to remain in for about a quarter of an hour, gradually receiving an addition to its contents during the period by an occasional stroke of the Higginson's syringe. After the cervix had become as far dilated as No. 2 could effect, No. 3 was introduced. But in doing so, considerably more difficulty was experienced, as the placental mass immediately over the cervix obstructed its introduction, and also prevented its being easily held in position whilst it filled with water. The supervention of uterine contraction had now likewise introduced an additional difficulty. But after anæsthetizing the patient, the bag was fairly fixed and dilated in the cervix, and gradually distended to the full extent permissible, during which process another quarter of an hour was expended. Immediately on its removal, the hand was introduced by the side of the placenta, and the feet of the child brought down. The delivery of the child was effected with little further trouble, and labour was completed by 10 o'clock P.M., two hours only having elapsed since the commencement of the operation. At first the infant showed little signs of animation, but after a little time, and the ordinary restorative treatment, it breathed well and cried lustily. During the operation there had been some, but not great hæmorrhage, and as soon as the placenta was expelled, rigid contraction of the uterus ensued, with complete and permanent arrest of the hæmorrhage. The child was small, but fairly developed, and evidently not far short of the full period. The patient made a rapid and excellent recovery. The child languished and died after three days; and notwithstanding our orders to take care of it during this period, we could not get the attendants to pay that amount of attention to its nursing and comforts which its weak condition required, and our suspicions of partial neglect were not diminished, when a funeral certificate was presented to me for signature.

CASE II.—About 4 A.M., an the 22d June 1871, I was hurriedly summoned to see Mrs ——, Northumberland Street, Edinburgh, who had suddenly passed, per vaginam, a large quantity of blood, about a quarter of an hour before, while in the act of micturition. She was thirty-seven years of age, and was, as she thought, about two months or six weeks from her confinement. (On close questioning, I failed to elicit grounds for a more definite calculation as to the exact period of expected delivery.) She now was carrying her seventh child, and all her previous labours had been easy and without complication. I found a considerable quantity of blood in the chamber utensil, and on vaginal examination everything seemed perfectly normal, except that the finger, upon removal, was slightly tinged with blood, and that the cervix felt puffy and loose, and the presenting part of the fœtus distant. The patient also remarked, that for some months previously, she had felt a fulness in the lower third of her abdomen, more than she had hitherto experienced in any of her former pregnancies. The active hæmorrhage had completely ceased, and it was quite impossible, from the high position of the parts, and the occluded state of the os, to form any opinion other than mere conjecture regarding the source of the hæmorrhage. I prescribed an astringent mixture, composed essentially of diluted sulphuric acid, and enjoined the maintenance of the recumbent position, and the employment of a cool regimen. Eight days afterwards there was a slight recurrence of the bleeding, but nothing further of importance appeared till the 8th of July, when there was another gush, similar to the first, about 8 o'clock in the morning. After this occurrence, there was never a complete absence of the red discharge, the patient, as she termed it, feeling always slightly wet. Meanwhile, the cervix became at its lower part somewhat relaxed, so as to reveal the existence of a small fibroid polypus in the anterior lip, attached just within the external os. As I failed to reach any portion of the placenta with the examining finger, I began to fancy that this polypus might possibly have something to do with the hæmorrhage. But this renewed large amount of bleeding made me now morally certain that such was not the case.

On the morning of the 17th of July, I was suddenly called to my patient's bedside at about 7.30 A.M., and found that she had just passed a much larger quantity of blood than at any time hitherto. The blood had been partly passed into the chamber utensil and partly upon the carpet, and was evidently large in quantity; and, on examination, I found it still continued to flow, though in diminished amount. Being able now to feel with the examining finger what I was persuaded was a portion of a placenta over the inner os, and feeling assured that further delay would only prove injurious to the mother, and seeing, indeed, that the symptoms of the destructive constitutional effects of the hæmorrhage had actually begun already, while, at the same time, I had every reason to believe that the child was perfectly viable, I resolved to dilate the cervix at once, and effect delivery without further delay. The nurse, who lived close by, was accordingly summoned, and I meanwhile went for my chloroform and ergot and my set of Barnes's dilators. At 8.30, I proceeded to commence the dilatation. After anæsthetizing my patient, I introduced in succession Nos. 1, 2, and 3, without much difficulty, and with surprisingly little concomitant hæmorrhage, notwithstanding that the dilatation of the cervix revealed a most absolute placenta prævia, which involved the whole of the cervix and a great portion of the lower segment of the uterus, instead of its being, as I had been fain to suppose, from the comparatively small bleeding up to the present morning, a case of placenta lateralis. In less than half an hour, I had dilated the cervix to the full amount practicable by No. 3 dilator; and while the latter was slowly allowed to collapse, I introduced my right hand into the vagina and through the os, and passing it through between the left side of the placental mass and the corresponding surface of the uterus, separating the placenta from the uterus as the hand advanced, I then found that the child presented in the most common position of the head; and passing my hand now through the membranes, I got hold of the right foot of the child, and effected version with little difficulty. During this act, however, there was a very copious flow of blood, and I had consequently to hurry the delivery by traction upon the body of the child, aiding this effort by compression and manipulation through the abdomen upon the uterus, so as to compel it to contract upon its gradually lessening contents, for as yet there had not been a *single* pain. After the delivery of the child, the placenta separated spontaneously in about one or two minutes. A tendency to bleed, which developed itself at this moment, was checked instantly by the injection of a stream of cold water for a second or two into the interior of the uterus by means of a Higginson's syringe. This induced powerful contraction of the organ; a dose or two of ergot, so soon as the patient was conscious enough to swallow, succeeded in keeping it up.

The infant came round after the usual efforts at resuscitation, and seemed for some time likely to do well. It never breathed very satisfactorily, however, and died in about ten hours. It seemed somewhat premature, but not much. The mother made a rapid and safe recovery, was up and about in three weeks, and was able to take a drive before the completion of the fourth week.

Now, I think every one will allow that the danger and difficulty in respect to the treatment of placenta prævia are essentially different in proportion as we find the placenta occupying the whole or only a part of the cervix; that is, in other words, whether the case is one of whole or of partial placenta prævia. In the former case, the hæmorrhage is almost sure to be very great, and to require very active measures of treatment; in the latter, the hæmorrhage need not necessarily be so copious, and is much more amenable to treatment. In the case of partial involvement of the cervix, the case ought, and generally does, terminate favourably both for mother and for child, without any interference other than rupturing the membranes when the labour-pains come on, and facilitating the delivery. In such cases, we rupture the membranes in expectation that the head of the child, when it gets pressed upon the placenta as it engages in the pelvis, will itself form a safe and efficient plug, and avert further dangerous hæmorrhage.

But, no doubt, even in such cases, the bleeding is at times so severe as to render the life of the mother in jeopardy, and under such circumstances active interference on the part of the accoucheur is demanded to hasten the labour to a close, either by version or forceps, or otherwise.

In such circumstances, the use of the indiarubber dilator is of invaluable importance, as it furnishes us with a safe means for preparing the cervix for the introduction of the hand, forceps, etc., whilst its presence, for the time being, mechanically arrests the hæmorrhage, as it rapidly dilates the os.

In such cases, also, accidents are apt to occur which threaten the life of the child, necessitating active interference on the part of the accoucheur. More particularly is this the case when the placenta threatens to be pushed down in front of the head of the child, and, consequently, to be born before the fœtus, or when a prolapse of the cord takes place. These accidents both occurred in a case of partial placenta prævia, which I communicated to this Society some time ago, and in which case I had to effect delivery by first dilating the imperfectly distended cervix, and then turning. This case terminated favourably for both mother and child; but when I recollect the difficulty I experienced in dilating the cervix at that time, and contrast it with the ease with which the cervix yields to the indiarubber bags, I regret much I was not then aware of the advantage derivable from their employment. The only case of partial placenta prævia I have met with since that period, yielded most readily to rupturing of the membranes. The bleeding had been rather severe, and a pupil of my own, who had charge of the case, sent for me in considerable alarm. It was a good case of placenta lateralis. The placenta covered a good portion of the right side of the cervix, and overlapped the os at its right side. But so soon as the membranes were ruptured, and active contractions set in, the child's head came down upon the inlet of the pelvis, and the placenta rather retracted, giving rise to no further hæmorrhage. The case turned out otherwise peculiarly difficult. But there was no trouble from the bleeding.

Though, in passing, I have thus referred to the treatment of partial placenta prævia, it is to the treatment of severe cases of unavoidable hæmorrhage that I mean at present to direct attention more especially, and particularly to urge the advantage of employing the indiarubber dilators in these dangerous cases.

In those cases the whole of the cervix, and no small portion of the lower segment of the uterus, are usually involved as the seat of the placenta, requiring action to be taken both promptly and skilfully.

However obstetricians have differed in respect to the proper treatment of the milder cases, and a variety of methods have been introduced which I do not stay here to enumerate, it has generally been agreed that in such severe cases the proper method is to effect delivery by the safest and speediest method possible, which is usually by turning. But this operation, it seems to me, has been usually too long delayed, on account of the difficulty experienced in finding room for its safe completion in consequence of insufficient dilatation of the cervix; and consequently the patient has been allowed to bleed, slowly it may have been, but yet steadily, till, before an occasion for operation presented itself, the mother has become already moribund, thereby leaving a very uncertain chance for its successful issue, so far at least as the mother is concerned. It has been held also that in such cases there exists a very great tendency to injurious laceration of the cervix, on account of its structure being so largely involved in the placental sinuses. Without denying a degree of cogency to this opinion, I humbly affirm that, judging from my own experience in this matter, I believe far too much has been made of it, since we really find the cervix surprisingly easily dilated and little inclined to tear in such cases. All violence should be excluded from obstetrical operations of every kind, and we think that with ordinary care such accidents should not occur, even in dilating with the hand. But at all events the gradual but certain and equable distention effected by the Barnes's bags, with proper attention in the act of introducing and filling them, removes all danger on the score of rupturing the cervix. One finds these cervices very much more readily distensible, as a general rule, under the influence of the indiarubber bags, than we experience when attempting to dilate an ordinary cervix for the purpose of facilitating premature labour; a fact in practical experience which was forcibly impressed upon my mind no later than last Sunday evening (21st April). To obviate the difficulty and danger of dilatation, the late Sir J. Y. Simpson proposed the complete removal of the placenta in a certain number of cases in which the danger from bleeding was very great, and the practical difficulties in the way of dilatation were also great or fraught with danger. Though I never could see my way to believe the theory of my much revered teacher in regard to the source of the hæmorrhage in cases of placenta prævia, yet from my experience of his method in another case which I also communicated to this Society, I felt convinced that it is one of the methods of arresting hæmorrhage in such cases. And as it is not at all impossible that a true practice might be supported by and built upon a false theory, I was not inclined to quarrel about the theory, provided the practice proved sound. But this method of practice, even granting that it is effective (and I consider it is so, to some extent at least), was only recommended by its distinguished author as a *dernier ressort*, when other efforts at effecting delivery were either inapplicable or had been tried and found wanting, and it certainly condemned the child to perish hopelessly. As the dilatation by means of Barnes's indiarubber bags removes almost entirely the difficulties in respect to dilatation which Sir James Y. Simpson's plan was meant to obviate, the sphere of action of that method seems to me almost entirely removed, and that in all such cases dilatation ought to be preferred to complete separation. Although I have not much to boast of in regard to the results upon the children in the two cases I have read, I can at any rate say that they were brought both alive into the world, and I fully believe that if, in the first case, an ordinary amount of care and attention had been bestowed upon the poor child, it ought to have pulled through. But every circumstance, both in regard to warmth and nutrition, was against both mother and child; and, moreover, I have a strong suspicion that the parents cared fully as much for the funeral money as they did for the life of the infant. In this I am probably mistaken. But even had they been ever so willing to provide for its wants, their extreme poverty prevented them from getting those comforts and attentions which the weakness and prematurity of the infant required. In the case of the other child there never was good breathing, and I think it suffered severely from being nearly suffocated in its passage through the pelvis. It it is to be remembered, that the mere fact of footling presentation is in itself, in cases of turning like the present, less favourable to the life of the child than head presentations, as the child's intrauterine life is suddenly stopped before it has the opportunity to breathe; and again we have reason to believe that the fœtus, in its efforts to respire, inhales very objectionable materials into its air-tubes, which subsequently give rise to lobular pneumonia, and so forth. When to this we add the difficulty of dragging a child through a cervix obstructed by the large mass of the half-separated placenta, and that the children in these cases are mostly always more or less immature, it is not to be wondered at that they are so apt to be lost during delivery, or are found incapable of being reared. The mother's life and health are out of sight the most important in such cases; and in those two cases which I have just recorded, I never saw better recoveries than they both made.

As to the time of operating, I think it is of the highest importance to commence early, if we mean to save the mother from risk. Nothing can be gained by delay, if we are satisfied that the bleeding is really serious, and if continued would lead to great risk to the mother's life and health. In such cases, therefore, as present really serious bleeding, the indiarubber dilators allow us to select our own time. We are no longer obliged, as was wont to be the practice, to wait till the hæmorrhage had gone on so far as of itself to induce premature labour, and dilate the cervix to such an extent as to allow of active interference. So soon as the bleeding is really serious, and likely if persisted in to endanger the life of the mother, then I hold we are bound at once, and without fear of any evil consequences, to proceed to dilatation and delivery. This can be safely and surely effected, as happened in my second case, without the occurrence of a single natural pain, the uterus being made to contract closely upon its contents, as they are gradually lessened, by externally manipulating it through the abdominal wall. Special care is needed to make certain that its contraction is good after the expulsion of the placenta. I believe, however, there is not in such cases any great difficulty on that score. In the second case I have recorded, I found that a jet of cold water injected into the cavity of the organ immediately after expulsion of the placenta, secured effective and complete contraction of the uterus, which continued to arrest all further bleeding. To make more certain, however, I administered to my patient a dose or two of the liquor ergotæ so soon as she was sufficiently conscious to be able to swallow. In the other case, pains had already begun previously to the period that I had considered it proper to interfere, so that there was no extra care needed to get the uterus to contract.

One word in conclusion, in regard to the introduction of the indiarubber bags. Their application, I must confess, presents no little difficulty to those who have not had a little experience in dealing with them. It is commonly recommended to employ an elastic catheter as an aid to their introduction. Now, I have found that an elastic catheter is not at all suitable, and that the best means to introduce them is to use a uterine sound. The bags ought to be first well greased, and the blunt end of the sound should be introduced into the little cavity or pocket which is attached near the distal end of the bag. An ordinary amount of care will prevent the sound from penetrating the membranes, as the soft bag is between the point of the instrument and them, whilst in cases of placenta prævia we have the additional intervention of the placental mass between the bag and the membranes. The end of the bag must not be made by the sound to impinge perpendicularly upon the presenting surface, but must be pushed more or less backwards, forwards, or to either side, so as to get a good hold of the cervix when the bag is distended. The sound should be left in so as to keep the bag in position while it is being distended, after which its own form keeps it in its place, and the sound may be safely withdrawn.

As the presence of a portion of the placenta right over the os is an annoying obstruction to the introduction of the bag, one is strongly tempted to introduce the whole hand into the pelvis and to push the bag into the partially open os by the fingers. This is a method which is to be avoided, as it is very unsuccessful, and is painful and irritating to the patient. A little skilful manœuvring with the sound is certain to be successful, and is little if at all irritating.

ARTICLE IV.—*Remarks on the "Health Resorts" of Europe.* By C. MOREHEAD, M.D., F.R.C.P.

VERY recently, several valuable contributions have been made by Dr John Macpherson to the literature of the "Baths and Wells" of Europe. This subject, with its cognate one of Climate, is important, and far from being as yet satisfactorily determined.

Some years after having been closely engaged with the consideration of the diseases of India, I experienced a great desire, with reference to the management of the sequelæ of these diseases, to examine the principal health resorts of Europe.

It was my privilege at that time to have ready access to the wise and friendly counsel of Sir James Clark. Encouraged by his advice, and assisted by a valuable memorandum of hints from his pen, I carried my intention into effect in 1860 and 1861. On my return to England, I addressed the following letter to Sir James Clark.[1] It gave not only the impressions left by recollection on

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[1] Since this letter was written, I have, in 1864, resided for several months in the Pyrenees, chiefly at Bagnères-de-Bigorre, visiting, for varying periods, Luchon, St Sauveur, and Cauterets. This renewed and extended acquaintance with the watering-places of the south-west of France did not modify my general impressions respecting such resorts.

In regard to the climates of the south-east of France, the Riviera, and Italy, my mind, but also as confirmed by a careful perusal of the full notes which I had made of every place that I visited.

Remarks on health resorts written ten years since may perhaps seem very useless; but, as these deal entirely with principles, if they were true then, they must be equally true now.

LONDON, 13*th October* 1861.

When I returned to England in the spring, I found your house deserted, and was disappointed in not having the pleasure of seeing you, and giving an account of my wanderings. My impression is, that I have not written to you since I received, at Hyères, your kind letter of hints.

I left Hyères early in December, went to Cannes, Nice, Mentone; by the Riviera to Genoa, Pisa, Florence, Rome, Naples, then back to Hyères by Marseilles early in February; visited the naval hospitals at Toulon, and returned to England early in March, by Nismes, Montpellier, Toulouse, Bagnères-de-Bigorre, Pau, Biarritz, Bordeaux, and Tours.

I stayed at the different places varying periods, according to their importance, but at none longer than twelve days; of all, I made as full notes as my opportunities of observation admitted of.

It is most difficult to come to a satisfactory conclusion about these Ligurian and Italian winter climates. Perhaps I did not see them to the greatest advantage, as the season was, I believe, unusually wet. At Hyères, a regular mistral was rare; and there was not, I think, that same degree of regular cold land-wind coming on towards sunset which is so characteristic of the seaboard from Cannes, I suppose I may say, to Naples—at all events, to Genoa—and which, preceded by the bright midday sun, is so treacherous. As you remarked in your note to me, the thermometer is an unsafe guide. It is not only that these dry sharp winds abstract heat rapidly, but there is also less constitutional resisting power—less power of generating animal heat. I know that in the tropics, and also in a good honest English winter, you can make yourself up for the climate; but when you have a compound of tropics and arctics in the twenty-four hours, it becomes very

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my estimate is somewhat higher than it was when I wrote this letter, because a longer experience of English winters has shown me that they are more variable than I had supposed, and that an advantage from greater steadiness can hardly be conceded to them. Still, the fact of sudden viscissitudes from heat to cold in these southern climates remains, necessitating prudence, attention to clothing, and care in respect to cold winds, which, fortunately, blow in winter and spring with a good deal of regularity, and may thus be guarded against.

What visitors to the south in search of health seemed to me not to understand was, that they required warm clothing, that they must learn of each place the directions from which, and the time when, the cold winds blow, and either avoid them by remaining indoors, or by seeking positions sheltered from them, or meet them suitably clad, as their cases may necessitate.

puzzling. During the preceding winter in London, I never once put on a comforter—the *beard* was sufficient; but last winter, in these climates, I never went out without one, and yet the beard was in greater glory. The greater distance of Hyères from the sea is, no doubt, also an advantage to some; but, on the other hand, there is intervening wet land after rain, which I fancied ought not to be lost sight of, at least with tropical invalids. I doubt very much the superiority of Mentone over Cannes and Nice. There are quite as many gaps in the mountain-barrier, with funnel valleys at right angles to the coast-line, for the passage of the evening land-winds. True, the north-west winds are intercepted by a mountain, but merely to be deflected into a west wind, which sweeps the line of road of the westerly bay, and the main street of the town. About the centre of the bay, to the east of the town, there is a wall about fifteen feet high, perhaps a quarter of a mile long. It is upon one side of the road, and the sea is upon the other. The road there is well sheltered from the north and from the west. It seemed to me the only very sheltered spot at Mentone. My Indian eye also looked with suspicion on the wide torrent-beds, of which there are at least three close to the road to the west of the town, in an extent of about two miles. St Remo I stopped at only two hours. Nervi, on the other side of Genoa, I only observed as I slowly passed through it; but I had afterwards the opportunity of comparing my notes with the information of a friend who had resided there two years. The protection from the north seemed very good and continuous, and the lemon tree as abundant as at Mentone.

Of Pisa, Rome, and Naples, I shall only say, that the *un*sanitary state horrified me. One bright Sunday afternoon, I was walking on the Villa Reale with Dr and Mrs ——. They were ecstatic; I hesitated; but, on being pressed, was obliged to say, while admiring the beauty, that the odours were more atrocious than I could have conceived, and that there was no escape from them. Dr —— admitted the fact, but added that you soon became used to them, and that they did not seem to do any harm.

The winter climates of the south-east of France and the Riviera, of Florence and of Naples, to the feelings, reminded me of the cold-season climates of the Deccan table-land and Deccan hill stations in dryness, midday solar heat, and land-winds, with this difference, that the Indian land-wind of these localities and seasons blows chiefly in the early morning. Therefore I conclude that, speaking generally, these European climates are not suitable for those conditions in tropical invalids for which upland and hill cold-season Indian climates are uncongenial.

What a contrast is the climate of Pau! I was there four days towards the end of February, and all were different,—all were calm,—one clear and inviting to exercise, with a sun less oppressive than in the south-east; the second, cloudy, without a distinct sense of dampness, but creating a feeling of languor and depression; on a third, there was prostration equal to that of Bombay in the monsoon, after the rain and wind have ceased, and the heavy air has become a mitigated vapour bath. At Pau, however, there was not the moisture; and though there was no perceptible breeze, I was told by Dr Bagnall that it was the heated air from Spain—a sirocco; an excellent sedative in great bronchitic irritation, I doubt not, but there, I suspect, the virtue ends.

I was pleased with Bagnères-de-Bigorre. It was not the season for the other Pyrenean resorts, and that quaint place, Biarritz, was almost deserted.

Towards the middle of March, I went to St Leonards, Hastings, Eastbourne, Brighton, Worthing, Ryde, Undercliff, Haslar, Netley, Bournemouth, Weymouth, Sidmouth, Torquay, Teignmouth, Dawlish, Clifton, Bath, Cheltenham, Matlock, Buxton, then on to Edinburgh for a fortnight, to see my old friends there.

The scale and style of many of these places astonished me; and, passing from them rapidly through Birmingham and Manchester, it was impossible to miss the conclusion, that these splendid health resorts, where money is spent and health regained, are the necessary complement of our large manufacturing towns, where money is made and health is lost. I was most pleased with Ventnor, Bournemouth, and Torquay.

About the middle of June, I again started for the Continent, visiting Tunbridge Wells, Folkestone, and Sandgate on the way. I made for Paris, and from thence commenced my tour of watering-places, visiting Enghien, Neris, Vichy, Bourbonne-les-Bains, Plombières, Aix-les-Bains, St Gervais, Baden (Switzerland), Schinznach, Baden-Baden, Wildbad, Cannstatt, Homburg, Nauheim, Schwalheim, Soden, Kronthal, Wiesbaden, Wielbach, Schwalbach, Schlangenbad, Ems, Laubach, Kreuznach, Kissingen, Bocklet, Brukenau, Franzensbad, Marienbad, Carlsbad, Teplitz, Pyrmont, Aix-la-Chapelle, Borcette, Spa. At these places I stopped varying periods, according to their importance, at none more than four days; of all, I made notes, according to my own sense, of what I saw. I saw the medical men or not, just as I thought they could be useful or not; as, Pusaye at Enghien, De Laurés at Neris, Vidal at Aix-les-Bains, Falati at Wildbad, Spengler at Ems. I missed, to my regret, Durand Fardel at Vichy, but I saw Barthez for a few minutes.

I took advantage, as far as I could, of all opportunities of seeing the sick in hospitals, and forming my own judgment, as at Vichy, Bourbonne-les-Bains, Schinznach, and, very specially, Carlsbad. The French military hospital at Vichy, under Barthez, is a good institution, to which additions have lately been made. Cases from all the army considered suitable for Vichy waters — dyspeptic, hepatic, renal—are sent in sets for forty days' residence. Each patient is accompanied by a statement of his case, on which his state on admission to and discharge from Vichy, with a note of the treatment, is entered. A copy of this document is made in the Vichy hospital records; the original case is returned with the man to his regiment; after the lapse of a year, the regimental surgeon notes on the original case the *then* state of the soldier, and re-sends the document to Vichy, in order that the hospital record may be completed by addition of this last note. Now, in all this well-arranged system, there is doubtless an honest desire to test the true value of the Vichy waters. It has, I believe, been only a short time in operation, and the results can hardly be known. I confess that I do not expect much. I doubted the accuracy of diagnosis in some of the hepatic cases; and, as far as one may venture to give an opinion from very limited opportunities, the general character of disease was such as hospital discipline and ordinary treatment were quite equal to.

At Carlsbad there is a very good recently-built hospital for the Austrian army, built by general subscription of the Empire. It is almost exclusively for the hepatic and splenic sequelæ of the fevers of Moldavia, Hungary, and Lombardy, for treatment by the Carlsbad waters. I was fortunate in making my visit on a day on which a fresh party had arrived. I had thus the opportunity of examining a good many men in the state in which they are sent, and also some who had passed through the course. The Austrian assistant-surgeon was very civil, and was rather pressing that I should tell him what I thought of the various livers and spleens that passed under our examination. The men, speaking generally, had not the aspect of sufferers from hepatic or splenic disease; and, in a considerable proportion, I could not detect enlargement of either viscus, in which my Austrian friend coincided. In a few there was slight enlargement of the spleen, detectable by percussion, but not greater in degree than we would expect in India to remove by prevention of febrile recurrences and ordinary tonic management. Of the cases which had gone through the course, there was one with considerable splenic enlargement. The size on admission was explained to me, and, accepting it as correct, the decrease of the organ was not more than the same time, with ordinary management, and *without* Carlsbad, would have produced. I therefore saw no evidence of the efficacy of the waters in the hospital, and no cases calculated to prove it; and I could not avoid suspecting that the conclusions might not have been very different if I had been allowed to make equally free with the hundreds of promenaders around the Sprudel and the Muhlbrunnen. At Bourbonne-les-Bains and Schinznach I saw scrofulous joints looking just as they do in other hospitals, but the officers seemed satisfied.

Some general ideas and impressions are left floating in my mind after having seen all these places, which I will state to you. Perhaps they are erroneous, and to be corrected by more careful reflection and further observation.

1. They are, without exception, hot, and therefore not to be sought as cool summer resorts.

2. The attraction from beauty of scenery is the exception, not the rule.

3. Placed as most of them are in valleys, generally with central stream, often with spongy meadow margins, some in narrow valleys, as St Gervais, Wildbad, Plombières, Carlsbad, Wiesbaden, Ems, Kissingen, Brukenau, etc., the climates have the characteristics of such localities—viz., muggy midday heat, evening chills, and, towards September, morning fogs.

4. Residence is generally, in the towns, ill-provided with sanitary arrangements to meet the great periodical influx of visitors; and this evil must be an increasing one from year to year, very specially where the waters are purgative. Carlsbad, Ems, Marienbad, Kissingen, and, I believe I may add, Homburg, are illustrations.

5. That, in certain forms of disease, there is a therapeutic value in alkaline waters, as Vichy, Ems, Fachingen, Bilin; in eliminating waters of chloride of sodium—Baden-Baden, Wiesbaden, Homburg, Soden, Kissingen; of sulphate of soda—Franzensbad, Marienbad, Carlsbad; in mild sulphurous waters—Baden, St Gervais, Schinznach, Wielbach, and Aix-la-Chapelle; in chalybeate waters—Schwalbach, Brukenau, Bocklet, Kronthal, Pyrmont, and Spa,—taken internally, may be readily admitted; but it may be questioned whether, on the whole, the good is not more than counterbalanced by the evils of indiscriminate and excessive use, injudicious routine, and unsuitable climate. For myself, I would rather moderately imbibe the waters at the Brighton Spa than in the localities themselves.

6. As for the bathing and douching systems:—(*a.*) Set aside that prolonged use which excites febrile disturbance as a therapeutic error. (*b.*) Be sceptical as to an efficacy by cutaneous absorption of the saline constituents. (*c.*) Regard the use made by inland communities of brine springs—as Nauheim, Kreuznach, Oynhausen, the Soolen Sprudels of Kissingen and Soden and Pyrmont—as testimony to the value of sea-bathing in appropriate cases; and take hints from the bath organization of these places for the improvement of our sea-bathing establishments. (*d.*) The common temperature is about 96, therefore the action of all those which are slightly mineralized—as Neris, Plombières, Teplitz, Baden (Switzerland), St Gervais, Wildbad, Schlangenbad, Bagnères-de-Bigorre—is sedative, and therefore useful; but it is very doubtful whether the difference in kind of the small amount of saline constituent is of any importance. There was the greatest evidence of faith at Wildbad in the Bath-chairs, the crutches, the lifts, the numerous cripples; and there was a mystery about the organization, the sand-beds over the sources, the shallowness of the water, the artificial heating of the corridors, etc.; but, on inquiry, it was very evident that these seeming specialties were merely in-

genious methods of husbanding the scant supply of water and the scant degree of heat. (*e.*) The value of the different kinds of douche, general and local, in some circumstances, may be admitted; and this will bear proportion to the skill in construction and application. They are most complete at Neris, Bagnères-de-Bigorre, and the new establishment at Plombières. (*f.*) As to the mineralized baths of Vichy, Ems, Franzensbad, Marienbad, Schwalbach, Brukenau, Bocklet, Pyrmont, with their mud adjuncts, if action from absorption is doubted, there only remains more or less stimulation of the skin. (*g.*) Sudation is seldom the indication aimed at. The exceptions,—the occasional use of vapour chambers in many, their general use, combined with shampooing, at Aix-les-Bains. (*h.*) Hitherto, I speak of these baths, with reference to those who daily, by ablution, etc., attend to their skins. To such, these baths are of limited utility; but when the question has reference to those who have not these daily habits, then, doubtless, a month of periodical soaking must be very advantageous. How much of this view may be held to apply to the numerous spa-frequenters, I am unable to say.

Before leaving England, I became possessed of a book that had just been published—"Dictionnaire des Eaux Minérales" edited by Durand Fardel, and two or three others. It is the only book I have seen which treats the subject in a scientific spirit, and is not satisfied with a reproduction and constant reiteration of the rhodomontade of local writers.

I have not gone over and reflected over all these various health resorts without going often back in thought to my Indian life, and inquiring how the climate of India stands in comparison with these. There, as elsewhere, you have your bad localities and unfavourable seasons; but, what with coast and table-land and mountain, I incline to the belief that it is easier to make out a continuous year of salubrious, and, at the same time, sufficiently invigorating, climate in India than in Europe. The present problem is, by careful research and observation, to multiply the number of healthy coast, table-land, and mountain positions, arrange them well, and organize a system and machinery of changes with reference to the season.

But I must end this letter of unreasonable length.

ARTICLE V.—*Case of Recurrent Secondary Hæmorrhage after Amputation of the Leg, successfully treated by Ligature of the Femoral.* By JOHN A. M'DOUGALL, M.D., Galashiels.

THE fortunate rarity with which such treatment is rendered necessary, and its perfect success in circumstances certainly far from favourable, lead me to record the following case.

John L., æt. 67, a coal-porter, was, on the morning of the 18th December, while in the discharge of his duty, suddenly jerked from a railway waggon on which he was standing, and, falling between the rails, the wheels of one or more loaded waggons passed over his right leg a little above the ankle, crushing at the same time the great toe of the left foot.

I saw him within a short time of the receipt of the injury, and found him suffering markedly from shock; rest and stimulants rallied him, and he was removed to his own house.

There, with the kind assistance of Drs Somerville and Tweedie, I amputated, by the modified circular method, the injured leg in its lower third, removing at the same time at its metacarpo-phalangeal joint the injured great toe.

From the fact that the tourniquet did not act well, and that considerable difficulty was experienced in securing the peroneal artery, he lost a good deal of blood; this, coupled with existing *morbus cordis*, and the primary shock of the injury, depressed him much, and it was some little time before he fairly rallied.

Ordered brandy in teaspoonful doses every quarter of an hour, and warm beef-tea at intervals.

Vespere.—Pulse 90, of fair strength, surface warm, temperature 101°, slight oozing from stump.

His progress for some days after this was on the whole favourable; his pulse of fair strength, but very irregular; his temperature ranging between 101° and 102° F. There was slight sloughing of the margin of the flaps. The ligatures separated on the tenth day, and then the stump, which was looking well, was fully one-half healed.

3d January.—Bowels were moved this morning by a dose of castor-oil, but he complained much of the straining.

Vespere.—There has been some bleeding from the stump, and although small in amount, the rapid way in which it had flowed and its bright colour leave no doubt as to its being arterial.

Stump was elevated and cold applied, strict orders being given to keep a watch upon it.

4th.—There has been no return of the bleeding, but the stump was not disturbed, lest some protective clot might become displaced.

5th.—This evening I was hurriedly summoned to visit John L., as his stump was said to be bleeding profusely. When I saw him he was pale and blanched, the bed contained a large quantity of clot, and there was still very active hæmorrhage going on. From the direction in which it seemed to come, I hoped it might be some periosteal vessel which had given way, in close proximity to an unseparated slough, but as no bleeding point could be detected, I laid open the stump. I then found the anterior tibial artery to be its source. On attempting to ligature it I signally failed, as more than once it gave way under the tightening. The diseased condition of its coats was then but too apparent, so I cleared and tied it at as high a point as I could reach; here the ligature held. The stump was left open, and cold applied. The shock to the old man was very considerable, calling for the free exhibition of stimulants ere he rallied.

6*th.*—As there has been no recurrence of the bleeding, the stump was brought together by strapping.

For another week all went well, granulation did its work, and the stump was again wellnigh closed, when, on 13th January, when dressing the stump, I found the ligature loose in the dressings. Ere I had finished the dressing, however, the hæmorrhage recommenced, and with even greater force than on the former occasion.

Dreading much a repetition of the shock attending the opening up of the stump, and fully aware of the diseased condition of the vessel in its face, I determined to ligature the femoral in Scarpa's triangle.

Here, again, I acknowledge gratefully the assistance of Drs Somerville and Tweedie.

The operation was easy of performance, but the dilated condition of the vessel, and the attenuated state of its coats, rendered necessary more than usual care in the separation of its sheath, and in the tightening of the ligature; this accomplished, the bleeding from the stump ceased.

The limb was then wrapped in cotton wadding, and the patient removed to bed.

The circulation became very rapidly re-established. Ere evening, within eight hours of the operation, the stump had not only regained its warmth, but by its appearance and the presence of discharge gave very evident signs of returning action.

14*th.*—Has slept well, pulse good, temperature 101°, stump looking well.

20*th.*—Stump nearly closed; greater part of ligature wound healed by first intention; general appearance of patient satisfactory.

The bowels have been kept locked since the operation until to-day, when they were moved by an enema. During their action I carefully compressed the femoral on the pelvic brim, so as to avoid the pressure of the blood column at the point of ligature; spite of this there was considerable bleeding, not only from the ligature wound, but from the stump also; so soon, however, as the strain was over, this ceased.

27*th.*—Bowels again moved by enema, and the same precaution observed as regards compression of the vessel; again bleeding occurred, but to a very slight extent.

31*st.*—Ligature separated to-day, the eighteenth day from its application.

From this time all went well; the strength of the old man gradually returned, and, keeping pace with this, the stump healed kindly, and the ligature track gradually contracted. Now, 25th February, though maimed and disabled, he is cheerful and happy, and looking still for a certain " length of days."

This case, illustrative of a good and well-known proceeding in surgery, presents, I think, some features of interest.

Secondary hæmorrhage after amputation is always a source of grave anxiety to the surgeon, and the means for its arrest matter of deep interest. Often its occurrence calls most peremptorily for the exercise of his best judgment and ripest experience. Means applicable and most useful in other circumstances may be of no avail here, as deep in the substance of an all but closed stump may be the bleeding part. To secure this will he, by breaking up the stump, undo at once what it has taken reparative action days, it may be weeks, to accomplish? or will he, trusting nature's hæmostatics, aid her, by weakening the force of the circulation in the limb through ligature of the main trunk?

The circumstances of each individual case must decide this; the cause of the hæmorrhage, the condition of the patient, even the site of the amputation, are all points for anxious consideration.

In some, as in bleeding from an unhealthy stump, either the result of diseased reparative action, or from the morbid process for which the amputation was performed rapidly returning, we have no choice—to attempt to secure the bleeding part would in all probability be futile; ligature of the main vessel is the only resource. When from hæmorrhage, either rapid and severe, or because long continued, we find the vital powers of a patient much depressed, ligature of the main vessel may be a preferable proceeding. Opening up a nearly healed stump is an operation certainly attended by considerable shock, and the after-process of healing by granulation is necessarily slow. The site of the amputation also claims attention, for it is possible, as in the case of amputation of the thigh, that the bleeding may come from a vessel which, from its high origin, or more especially from its connexion with the nutrition of bone, would not be completely controlled by ligature of the superficial femoral.

As a general rule, however, it is undoubtedly best, in the first instance, to attempt to secure the vessel in the face of the stump. In the great majority of cases it is successful; and even where there is doubt as to the condition of the arterial coats, it is advisable, as we know well that the diseased action may be of most limited extent—a mere patch, which it is easy to get beyond. Failing this, failing acupressure, which in such cases sometimes acts admirably, we have the ligature of the main vessel as a *dernier ressort.*

The case just related is one in point; ligature in the stump signally failed, while deligation of the femoral was fortunately attended by success. This success, in circumstances certainly not very cheering, I cannot help associating to a certain extent with the management of the patient while at stool.

One fact struck me forcibly in connexion with the attacks of hæmorrhage, that they bore a direct relation to the strain attending movement of the bowels. This relation was not difficult of explanation. With a much hypertrophied heart, with atheromatous arteries, the natural elasticity of which had all but disappeared, under strong muscular effort, attended by fixed respiration and laboured heart's contraction, it was no wonder that the imperfectly vitalized clot gave way. This became the more apparent when, on compressing the femoral on the brim, I was conscious of his heart's stroke. Had in its full force that stroke been given, I am certain that all surgical effort would have been set at nought. I cannot but regard it, then, as a matter of great importance, where you have diseased vessels to deal with, this natural strain should so far as possible be avoided. All know well its danger in some cases of heart disease, and medical science bears many a record of its fatality. In many cases it is of course impossible to compress the vessel between the heart and the site of ligature, but in them I would carefully lock the bowels for some considerable time after the operation.

This is not difficult to accomplish. A nutrient dietary, containing small solid residue, can be readily arranged, such a dietary as conduces most decidedly to the formation of blood-clot, which, though a primary, is certainly a most important step in the occlusion of arteries.

It is a matter at least worthy of consideration—it is not difficult of management—it in no way interferes with the ordinary treatment of the case; and I cannot help regarding it as markedly conducing to the success of a case, the prospects of which were at the time of the operation far from favourable. Thus far;—but before closing, let me, in connexion with this case, say something of amputation above the ankle. Many good surgeons condemn the proceeding, and recommend that no amputation be performed between the ankle and "seat of election." The length of the stump, and the risk from its thin covering, of its being tender and painful, are the adverse reasons.

The first is, however, really no objection, as length of stump, giving as it does increased lever power, aids the machinist much; while the new modes of amputation have done much to refute the second.

The long rounded anterior flap, or the equal rectangular flaps, as recommended by Fayrer, give excellent results. For the proper performance of these amputations, however, the skin and tissues above the malleoli must be intact, and where, from the action of the disease, or more frequently the injury, these are destroyed, the majority of surgeons still hold that the operation should be performed below the knee. This adds much additional risk to life, and it sacrifices great part of a limb which may be most usefully retained. My experience, certainly not a large one, I would give very decidedly in favour of the low operation. I have amputated some inches above the ankle, both by the modified circular (with a high division of the bones), and by a long internal flap of skin (the limb treated in its outer side), and have had good reason to be satisfied with the results. In one instance, the patient walked with an artificial limb the distance of twelve miles within eight months of the operation. The good rule in surgery, to save as much of the body as possible in every amputation, needs, I think, no infringement,—this, formerly the only exception, might, I think, well be blotted out.

Article VI.—*Pleuro-Pericarditis—Paracentesis Pericardii.* By P. H. Maclaren, M.D., F.R.C.S.E., Lasswade.

(*Read before the Medico-Chirurgical Society of Edinburgh*, 3d *April.*)

A. D., æt. 27; paper-worker; tall, muscular, and well nourished; had previously enjoyed good health until between three or four months ago, when he began to complain of headache, short dry cough, with slight febrile symptoms, unaccompanied, however, by any pain in the chest. Under these circumstances, he continued to work for about a fortnight; but increasing dyspnœa and weakness at length compelled him to desist.

The practitioner who attended him for seven weeks looked upon his case as one of influenza, and used various remedies, which failed to check the progress of the symptoms. When I first saw him, 3d December, he had with difficulty walked a distance of a mile and a half to my house. His pale, swollen face, with anxious expression, betokened the existence of serious illness. On examining his chest, the dulness over the heart was found to be much extended in the transverse diameter, the apex-beat scarcely perceptible, the heart-sounds with difficulty audible with the stethoscope, and his pulse rapid, weak, compressible, of a peculiar sinuous character, almost amounting to irregularity.

His respiration was laboured and frequent. Inspiratory murmur anteriorly on both sides was exaggerated. No crepitation. Percussion resonance could be elicited throughout the whole anterior aspect of left lung; but on the right side the cardiac dulness could not be distinguished from a dulness at the lower third of right lung, which at the moment was presumed to be hepatic. Posteriorly, the respiratory murmurs were clearly audible on the left side, less distinct at upper two-thirds of right side, and inaudible at lower third.

The tongue had a white centre and very red edges; but the patient's appetite was good, and his digestion regular and painless. Urine was reported rather scanty, of a dark colour, and deposited a bright-red sediment.

The patient slept pretty well in the semi-recumbent position, which he could not change without great discomfort in breathing. He had never had rheumatic fever.

Was ordered to remain in bed; to take a mixture of iod. and acet. pot., and ℥i. of whisky ter in die.

On visiting him a few days after, I found there was slight general anasarca, that the urine was not albuminous, and that the quantity passed in twenty-four hours amounted to 3½ teacupfuls—about 18 oz., and that this had not been increased nor the general symptoms improved by the medicine he was taking. A similar result followed the use of a pill of cal. scil. and digital. Failing to rouse the kidneys to action, an attempt was made to carry off the extensive effusion through the bowels; and for this purpose a pill containing elaterium, increased from 1-8th to 1-4th of a grain, was given night and morning. By this means frequent watery evacuations were procured, and the general anasarca diminished—only, however, to a slight extent. But he still suffered from orthopnœa, and the pericardial effusion became so great that the apex-beat was entirely lost to the hand, and the heart-sounds to the ear. The character of the pulse was now exceedingly peculiar, best described as fluttering, indistinctly wavy, and easily compressible. His lungs, in which at first the vesicular murmur could be heard, began to evince coarse crepitation; and finally, on the right side, at the lower half of the lung, the vesicular murmur disappeared, the percussion becoming dull to the same extent.

As the continued use of elaterium was apt to reduce his strength, and thereby rather encourage the general exosmosis, that remedy was abandoned, and tinct. ferri mur. substituted. At the same time a succession of small cantharides blisters were ordered to be applied over the pericardium. After this his condition grew steadily worse, until, seeing the failure of medicinal agents and the great urgency of the case, I proposed and performed paracentesis pericardii, on Saturday, 10th February 1872. An incision was made, about 1½ inch long, transversely in the fifth left intercostal space, the inner edge of the wound being close to the left side of the sternum. After carefully dividing skin, superficial fascia, and the intercostal muscles near the upper margin of the sixth rib, the distended sac of the pericardium was felt, and an exploring needle trocar thrust into it. A serous fluid of a greenish-brown colour at once flowed from the canula, over the external orifice of which a piece of india-rubber tubing was slipped and held firmly, while the other end of the tube was kept carefully under water. In this manner 35 fluid ounces were discharged. As the sac was emptying, the heart, which had been floated up towards the left, gradually sank into its natural position, at length touched and afterwards rubbed firmly against the canula, giving rise to a disagreeable sensation the patient was unable to define. By withdrawing the instrument a little, and turning it towards the right, this discomfort was avoided. When the discharge ceased the pulse at the wrist was 108, well defined, the apex-beat distinctly perceptible, and the heart-sounds audible, accompanied by a soft friction murmur. The lips of the wound were now brought into close apposition, secured by three stitches, and covered with a piece of dry lint. The patient was able to lie down, and was manifestly relieved; but the relief was not by any means so great as I expected, or as might have been anticipated, after the withdrawal of so much fluid disturbing the heart's action and position. But the extensive pleuritic effusion on the right side and the œdema of both lungs being considered consequent to the pericardial disease, it was hoped that the removal of the cause would be followed by immediate subsidence of the effects.

11*th February.*—Breathing still much embarrassed; right lung very dull to within three inches of clavicle. Vesicular murmur only audible at apex. Left lung resonant anteriorly, duller posteriorly, and on both aspects respiration puerile. Heart's action very rapid. Sounds, beat, and friction murmur same as yesterday; urine rather more copious. Ordered tinct. digital. ʒi., t. ferri mur. ʒiii. M. 20 drops in water thrice daily after food.

12*th.*—Respirations 44; pulse 92 per minute, wavy. Heart's sounds audible, but no friction. Respiratory signs and symptoms as formerly; no bulging of intercostal spaces; ascites and anasarca unaltered; 27 oz. of urine passed in the twenty-four hours; wound healing by first intention. As the bowels had not acted since the 10th, ordered a pill of calomel and jalapine.

13*th.*—Bowels acted once; urine more copious, notwithstanding there is slight general increase in the effusion, and corresponding aggravation of all the symptoms. Orthopnœa returned; face much swollen; heart-sounds distinct; pulse 90, weaker; respirations 60 per minute. Ordered a large mustard poultice to be applied to right half of chest for three-quarters of an hour, and thereafter linseed poultices to be kept on continually.

15*th.*—Has had very little sleep, and feels drowsy and exhausted; heart-sounds fainter; pulse at the wrist one continuous vibratory thrill, impossible to count. Bowels have acted naturally. Urine 30 ounces.

16*th.*—Became mildly delirious in the afternoon, gradually weaker, and died about 12 P.M.

Sectio Cadaveris, sixty hours after death.—On opening the chest, the right pleural cavity was distended with about two and a half quarts of a straw-coloured serous fluid, passing through which thick bands of organized lymph connected the lung to the parietes throughout its whole extent. A strong sheet of lymph passed from the lung to the under margin of the fourth rib, and to a great extent shut off the principal collection of fluid, confining it below the level of that rib. The lung was firmly bound to the pericardium and anterior margin of diaphragm. On section it was crepitant in the upper third, very œdematous in lower two-thirds, and contained scattered miliary tubercles about the size of a millet-seed. The pleura on this and also on the left side was three or four times its natural thickness, studded on the inner surface with innumerable nodules of fresh lymph, and generally highly vascular. The left lung was pushed upwards and backwards towards the apex of the cavity and spinal column by the distended pericardium and pleural effusion. It was crepitant generally except at base, and contained also many miliary tubercles scattered above, more numerous, more closely sown, and larger below.

The pericardium greatly hypertrophied and partially distended with about 12 oz. of fluid similar to that removed by paracentesis. This effusion was of a greenish-brown colour, non-coagulable, and deposited on standing a lighter brown sediment, composed of blood-corpuscles, tri-nuclear cells, and molecular matter. The sac varied in thickness from a twelfth to a fourth of an inch, and was changed into a white dense substance resembling inter-vertebral cartilage. Its outer surface was covered with a coarse granular deposit of lymph on the left side, and on the right was firmly united by the same material to the right lung. On the inner surface of the pericardium, and in that portion of its serous lining covering the heart, there was a universal deposit of lymph of a pinkish hue, collected in large quantity around the base of the heart, especially posteriorly, and gave rise to a marked cauliflower appearance. There were no adhesions. The heart substance was of a brownish-slate colour and closely adherent to the thickened outer serous layer. The right ventricle was filled with clots; and all the valves were smooth and competent. The liver was normal in size and form; cells loaded with fat. Kidneys large and flabby; tubuli filled with fat-cells, but epithelial layer entire.

Remarks.—The insidious approach and obscure character of the symptoms of non-rheumatic pericarditis render its detection in the first stage extremely difficult. In Dr Stokes's arrangement of the disease into three stages, the phenomena included under the first form are nothing more than a series of negations. "Absence of pain or local suffering frequent; no sign of muscular excitement, nor any special character of pulse; no increase of dulness over the heart."[1] Unfortunately also the thermometer[2] is of no service here, and even at the more advanced stages is little affected. The only positive symptoms the patient exhibited were general debility, and a short cough without expectoration.

When he came under my care, seven weeks after the beginning of his illness, all the vital phenomena and symptoms of pericardial dropsy were so fully developed that no hesitation was felt in making the diagnosis. It was also soon evident that the impeded breathing and right costal dulness were due to pleural effusion, and that a limited degree of the same morbid action existed on the left side. Now, as the previous general health of the patient was good, and there was no history of any pain in either side, while also the pericardial dropsy was most pronounced and greatly embarrassed the heart's action, it was erroneously concluded that the mechanical obstacle giving rise to the ascites and anasarca produced the pleural effusion also. But the numerous strong bands of lymph which stretched across from lung to ribs in the right pleural cavity showed that a considerable deposit of lymph had taken place before effusion occurred; and the morbid changes the pleuræ themselves had undergone, was presumptive evidence that disease in these membranes and the pericardium was probably consentaneous.

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[1] Stokes on Diseases of Heart and Aorta, page 4.

[2] Wunderlich on the Temperature in Diseases. Syd. Soc., chap. xviii.

The medical treatment of the case extended over a period of nine weeks, and all the drugs used were subjected to a fair trial before they were discontinued as inefficacious. There was no opportunity for antiphlogistics. Paracentesis pericardii is very rarely performed (as one may judge from the fact that Dr Stokes has never seen it), but the operation is reported to have been done successfully by several writers mentioned in Trousseau's[1] excellent paper on this subject. Closer inquiry into the history of these successful cases always raises a doubt of their issue, as the disease when chronic and latent, like the present example, is usually associated with the tubercular or cancerous diathesis. In the present state of our knowledge, the operation can only be regarded as a palliative, which should never be withheld on account of the supposed difficulty or danger of performance. The points to be kept in view in removing the fluid from the pericardium are, to choose the most dependent spot practicable; to avoid injuring the pleura, internal mammary, or intercostal vessels; and prevent air entering the emptied sac. These indications were fulfilled in the plan I adopted; and my only regret is, I did not at the same time tap the right pleura, and give my patient more relief in the last days of an incurable disease.

ARTICLE VII.—*Insanity dependent upon Constitutional Syphilis.* By STRETHILL H. WRIGHT, M.D., Senior Assistant at the Royal Edinburgh Asylum, Morningside.

VARIOUS forms of mental disorder may be traced to a syphilitic origin; and the mental symptoms arising in the course of the disease may vary from an occasional and slight feeling of mental incompetence, dependent upon the constitutional depression which attends the development of the syphilitic virus, to those grave forms of mental and nervous disorder which, depending upon structural modifications of the membrane or substance of the brain and spinal cord, result, in many instances, in the utter wreck of the constitutional power, mental and physical.

It is not proposed in the present paper to discuss at length the subject of syphilitic affections of the cerebral and general nervous system; but it is desired to distinguish, if possible, between certain sets of cases, for the distinction being in so far one of degree only, hardly merits the title of a class distinction. In all these cases quoted in the following notice, the symptoms of mental disorder arose as effects from, and were closely connected throughout their progress with, a coexistent constitutional syphilitic affection, and yet they greatly differed in their gravity and amenability to treatment.

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[1] Trousseau's Clinical Lectures. Syd. Soc., vol. iii.

I have selected the following series of four cases, as I think they will illustrate the distinctions of which I would speak. Three of these are cases of persons who have been under treatment in the Royal Edinburgh Asylum; the fourth I have taken the liberty of quoting from an excellent paper by Dr Williams, of the Sussex Asylum, at Haywards Heath, which appeared in the *Journal of Mental Science* for April 1869.

I. The case of Mr P. On admission, this gentleman presented symptoms of nervous and mental disorder of a very acute type. The appearance of mental symptoms in this, as in the vast majority of cases of *acute* mental disorder, was preceded by a period of general constitutional ill health.

The patient had, for about two years previous to his attack of mental derangement, led a very dissipated life, and had suffered from more than one attack of constitutional syphilis. His general health became impaired under the combined effects of hard study, and the mental anxiety he suffered as to the results of his disorder. His mental perturbation at length became such as to attract the attention of those about him; he was observed to have undergone a complete alteration in disposition; he had become gloomy, morose, and silent—a change which was the more noticeable, as his natural disposition was of a lively, cheerful caste. Finally, this boding state of mind was interrupted by an outburst of mania, of such violence as to necessitate his immediate removal to a place of confinement; he was accordingly admitted into the Royal Edinburgh Asylum.

While speaking of information derived from the reports of others, not the results of personal observation, I may give the patient's own account of the invasion of his mental symptoms, as he described it when in a state to afford trustworthy information. He describes the invasion of his disorder as follows:—About four months before admission, being then affected with constitutional syphilis, he determined to reform his mode of life, and forego drink and sexual indulgence; he was reading physic hard at the time. The mental struggles he experienced in striving to carry out his resolution were very severe—so severe, that he was conscious of his disposition becoming changed under the trial; he felt that he was losing his self-control. This was some time before any abnormal symptoms were noticed by others. Finally, his power of self-control entirely gave way, and he was unable to resist his desire to destroy everything around him.

On admission, Mr P. was found to be covered with a syphilitic eruption of the secondary type; the scars of old chancres were also present. The symptoms of his mental disorder were those of the most violent excitement, *with intermissions*, during which all the symptoms of insanity were much mitigated. At the conclusion of these maniacal attacks, he sank into a state of unconsciousness, succeeded by clonic spasms of the flexor muscles of the left forearm and right side of the face, which, in turn, gave way to a series of epileptic fits, three or four in number, of a very violent nature. After emerging from these fits, Mr P. would stare about him for some minutes in a demented manner, as if his power was quite exhausted by the extreme violence of the epilepsy. While his mental disorder was at its height, the patient had delusions as to the identity of persons.

One very striking feature in this gentleman's insanity was its intermittent character; at first there was merely intermission in the violence of the mental excitement, but as recovery from the syphilitic disease and its accompanying febrile condition took place, intervals of perfect immunity from excitement occurred, during which he was quite rational and collected.

It is very interesting to note, that after the convulsive seizures had entirely ceased to succeed the maniacal paroxysms, and the patient had so far recovered as to give a rational account of his sensations, he stated that he was aware when a fit of excitement was coming on, as it was preceded by a creeping sensation of the scalp. Does not this very much resemble an epileptic aura?

Mr P.'s illness resulted in the perfect recovery of his bodily health, and the complete restoration of his mental power.

II. The next case in the series is that of J. B., a cab-driver, æt. 34.

The points to which I would specially draw attention in this case are:—That the patient has been more than once insane, and that before and since his first attack of insanity, he has suffered from constitutional syphilis. He has never had nodes on any part of his body. On the occasion of his first attack, he was a patient in the Royal Edinburgh Asylum. The symptoms of his insanity at that time were of the demented type; there was general failure of the mental vigour; he entertained delusions of a somewhat depressed type, and was childish and inconsequential in his conduct. There were no symptoms which call for special remark; as his wife well described his insanity, he did "awfu' (*Anglicè* very) daft-like things." He was resident in the asylum upwards of six months, and was discharged recovered.

This man has recently undergone a decided relapse; he seems, indeed, at all times, to waver on the border line of insanity.

I owe my knowledge of his present attack to the kindness of Dr G. W. Balfour, under whose care he has been in the Royal Infirmary here.

On the present occasion, his wife informed me that she first noticed symptoms of decided insanity after the violent action of a dose of purgative medicine; he was much reduced by the action of the medicine, and, as she phrased it, "has never been right since."

The symptoms of his present attack somewhat differ from those reported as shown by him on the occasion of his previous illness. His insanity is now very markedly intermittent in character; at times he is quite well; he entertains no delusions; indeed, his disorder seems to consist of more or less constant intense nervous irritability, which renders him extremely sensitive to any little annoyance. "No one can please him." He suffers also from occasional severe neuralgic pain in his left temple, which is very sudden in its invasion, extremely severe while it lasts, and equally sudden in its departure. He has never had even a threatening of a convulsive epileptic seizure.

III. The third case is that of Mr M. This gentleman's is a typical case of chronic insanity in connexion with constitutional syphilis. The history of the case is as follows:—The patient is naturally a man of a highly susceptible nervous temperament. He has been insane for about seven years. Before becoming insane, he was employed as an insurance agent, and was painstaking, and very conscientious in the discharge of his duties. The first symptom of mental unsoundness betrayed by him, was the manifestation of groundless suspicion as to the disposition of others towards himself; he imagined that his employer tried to damage his prospects, and that his landlady wished to poison him. His mental and nervous disorder at length became such, that he attempted self-destruction; he was then placed under restraint. Mr M. has, on two separate occasions, been an inmate of the Royal Edinburgh Asylum; during the interval he was a patient in other asylums.

On the occasion of his first residence at Morningside, he is reported as suffering from a syphilitic affection of the secondary type. His mental disorder is described as being intermittent in its character; it took the form principally of acute mania, and the paroxysms of excitement were sudden in their invasion, and very severe. He entertained delusions of the wildest kind, chiefly referring to crimes and outrages connected with criminal sexual indulgence; but he also entertained delusions of suspicion, as described above. He was considered a dangerous patient.

It is from the time of his second admission that my personal knowledge of his case dates. At this time he was in a pitable state of bodily ill health and mental disorder. He was affected with tertiary syphilis; had at least one distinct node on the head, and has since, more than once, suffered from chronic syphilitic swelling of the testicle. His appearance on admission was wild and haggard; he was extremely suspicious and irritable, and his delusion as to the evil disposition of others towards himself was very prominent. He was also suicidal.

Since that time this gentleman's condition has undergone a marked improvement, mentally and physically. The symptoms of his mental unsoundness never quite disappear, but they intermit in severity for prolonged periods, and depend very much on the state of the weather, the occurrence of slight bodily indisposition, etc., to bring them into prominence. Though his mental condition will probably never be such as to warrant his entire liberation from control, still he now has sufficient self-command to be entrusted with all the privileges accorded to the most responsible patients in the asylum; he has the unrestrained liberty of the grounds, and frequently walks alone beyond bounds.

IV. The last case of the series is that which I have already mentioned as being quoted from the paper by Dr Williams, in the *Journal of Mental Science* for April 1869. This patient, a female, led a very dissipated life; before admission to the asylum, she had for some time suffered from syphilis; when admitted she was in a state of great mental prostration; she refused food, neglected the calls of nature, was taciturn, and avoided the society of others; yet, if roused, she was capable of answering intelligently, and of recalling past events. She is further described, on admission, as being of stout bodily habit, but of a flabby unhealthy appearance; she presented well-marked symptoms of both secondary and tertiary syphilis. Some time after admission she is reported as complaining of severe headache, with impairment of hearing; she was also subject to attacks of vertigo.

After a residence of four months, she began to suffer from epileptic fits.

Again, after a space of two months, her cerebral disorder assumed the form of mental excitement; the headache and vertigo at this time disappeared. *The syphilitic eruption appeared and disappeared at intervals during the course of her illness.* Finally, the pain in the head, with vertigo, returned; the vision became affected; left-sided hemiplegia gradually crept on; general failure of the mental power succeeded; and she gradually passed into the comatose condition, in which she died.

These cases may, I think, be considered as exemplifying—1st, A very acute form of syphilitic insanity; 2d, A chronic form, with occasional exacerbations in the severity of the symptoms; and, 3d, A chronic variety, where the mental symptoms, chiefly, though not entirely, depended upon very grave organic change of the nervous centres, leading to an inevitably fatal issue.

It is, I believe, rare that a case so acute, and so rapid in its progress as that of Mr P., the first in the series, is met with. The mental symptoms shown by this gentleman bore to the syphilitic affection, from which he suffered, very much the relation that the head symptoms in many fevers do to the special disorder in the course of which they arise. The mental disorder was very sudden in its invasion. The excitement much resembled ordinary feverish delirium. His delusions were remarkable for their incoherence; and this mental condition was accompanied by a highly feverish condition of the system generally.

These head symptoms bore a very marked relation to the presence of the syphilitic eruptions. They abated as it faded.

One of the most interesting features of this case is the occurrence and nature of the epileptic fits. It is true that epileptic fits frequently occur in more chronic cases of insanity traceable to a syphilitic origin; but in such cases they may be generally accounted for by the presence of nodes or morbid intercerebral changes. In this case, certainly, no such organic change had taken place.

In reference to the occurrence of epilepsy, then, in this case, I would notice that, for some time past, the patient had given the rein to his sexual inclinations. Now, it is subject of remark, that when the sexual instinct is much and strongly excited for a prolonged period, a congested and irritable condition of the medulla oblongata is very likely to be produced. Van der Kolk, when treating of the pathology of epilepsy, remarks:—"From all this" (evidence previously adduced), "I think we have sufficient reason to conclude, that the first cause of epilepsy consists in an exalted sensibility and excitability of the medulla oblongata, rendering the latter liable to discharge itself on the application of several irritants, which excite it, in involuntary reflex movements." And, again, after enumerating several causes, such as onanism, which might produce this *susceptible* condition, he says:—"In the commencement there is only exalted sensibility. If the cause be removed or moderated, the epilepsy gives way of itself, especially if the sensibility is not renewed by remote causes."

He further remarks on an incurable epilepsy followed by incurable dementia, where organic changes have taken place, and continue to give rise to these phenomena.

How well all this applies in the present instance. Here there was no organic change, only an exalted sensibility; when the medulla recovered from this, and as the general excitement passed off with recovery from the syphilitic disorder, the epileptic seizures ceased, and did not return. The convulsive attacks *followed* the paroxysms of mental excitement. I would therefore submit, that probably general excitement was produced first by the stimulation of a brain rendered susceptible by constitutional disease; and that subsequently a further and special manifestation was made by that part of it which had been rendered specially sensitive through the prolonged action of a special irritating cause, *i.e.*, frequent and prolonged sexual excitement.

The result of treatment also in this case is most interesting; and exemplifies, I think, the importance of a non-empirical treatment of mental as of all other disorders. The syphilitic affection, in the course of which the mental symptoms arose, was treated specially with iodide of potash, the general health being at the same time duly regulated. Bromide of potash was also given to subdue the excessive nervous irritability. Under this treatment the patient steadily improved; and I would again draw attention to the close connexion which existed between the mental disorder and the state of bodily health: as the patient recovered from his bodily disorder, he also regained his mental stability. During his convalescence he occasionally underwent slight relapses—more tendencies to excitement than actual outbreaks. He is now perfectly well, and has never since his discharge shown any symptoms of unsound mind.

The second and third cases I have quoted as affording excellent examples of chronic insanity dependent upon a persistent syphilitic condition of the constitution. They differ from each other considerably in the gravity of the symptoms displayed. The insanity of J. B. partakes more of the nature of "dementia;" it belongs, so to speak, to a lower class of insane manifestations than that of Mr M. J. B.'s insanity is not constant, it intermits; and intermits, not only for long periods, but for even days and hours, leaving him in the interval to all appearance sane. Mr M.'s insanity also intermits in severity, but is never entirely absent. At times the manifestations of unsound mind shown by him are more violent and extravagant. He entertains, *when excited*, delusions of an erotic kind, as well as others of a more general nature. He is reported, when at his worst, as being homicidal; but during my experience of his case, his mental disorder has never been such as to produce this latter manifestation.

Again, in these cases, the relation between the syphilitic affection and the display of mental symptoms is of the most direct nature. Both these patients require to be kept well. When "let alone," both —especially Mr M.—become rapidly very insane; but, by the use of iodide of potash and other suitable remedies, they regain their equanimity. J. B. has, I believe, occasionally been treated with mercury in alterative doses. Mr M., since his last admission, has never had mercury. He has many times had exacerbations of his insanity, and has always been rendered comfortable and regained his equanimity on the use of the iodide of potash. Indeed, while under my immediate care, he would frequently beg that the medicine might be renewed, as he felt his feelings of discomfort again gaining the ascendancy. These two persons have, so to speak, become syphilized; they are in a condition in which, at intervals, or more or less constantly, their disease so affects their mental vigour as to render them incapable of rightly adjudicating on the impressions they receive; but when this constitutional condition is combated by appropriate means, they regain altogether, or in a certain measure, their equanimity.

As a parallel instance of this syphilized condition, and the necessity that exists for constant supervision and care in such cases, I would refer to a case reported by Mr Coulson, Surgeon to the Lock Hospital, in his work, "A Treatise on Syphilis." What makes this case interesting, as showing the nature of the influence exerted by the bodily disease in producing insanity, is the fact that here exacerbation of the syphilitic disorder produced an extremely susceptible, irritable condition of the general nervous system, but did not produce special symptoms of *mental* disorder, probably because, in the present instance, the brain was not so disposed to derangement of its functions as in the cases just related. The case is as follows: Mr Coulson had under his care a gentleman suffering from syphilitic sarcocele; he was treated with iodide of potash, and recovered. I give the rest of the case nearly in Mr Coulson's own words. "A few months after he got married, but continued to take the remedy, by my advice, once a day for some time. The gentleman had attempted to leave off the medicine, but shortly was obliged to return for further advice." On the first attempt he discovered that his general health began to decline. Two or three months afterwards, he became weak, his appetite failed, he lost weight, and night sweats ensued. As he lived in the country, he resumed the iodide without consulting any medical man; the appetite at once improved, and he quickly recovered his usual health. "He repeated the same experiment" (left off the iodide), "but under the advice of a physician, who ordered him to go to the seaside, and to take quinine with iron. The change of air and of treatment was not attended by the result expected. The symptoms already described began to manifest themselves again, and the patient was again compelled to resume the iodide." This case affords, I think, another excellent example of a man who required "to be kept well." He did not betray any mental symptoms of a gravity to be considered as indicative of insanity, but in other respects his case presents a close analogy to those already mentioned. This would indicate that the effect of such a constitutional affection is in great measure predisposing; it acts, more especially at least in the chronic forms, by producing a state of mind predisposing to insanity, although it may undoubtedly also influence in great measure the nature of the manifestations displayed.

To complete the series, I shall beg leave very shortly to refer to the last case, that of Dr Williams.

This case would appear to belong to another category than that which claims the first three. The very grave symptoms of this case depended upon organic intercerebral change. During the patient's residence in the asylum, she bore the well-marked evidence of syphilitic affections, both of the secondary and tertiary type; she had secondary eruptions, and also condylomata on the labia, with a very offensive discharge from the nose, which had been present for some months. Her head symptoms also presented a curiously mixed character. On admission, she was melancholic and apathetic, but could at first be roused; then gradually symptoms of a very grave nature supervened. She became affected with severe headache, vertigo, and drumming in the ears, and had several epileptic seizures. Symptoms of a more acute character occasionally showed themselves; she is reported as becoming excited, and again as being more composed. The eruption, which had at the time of occurrence of the more acute symptoms made its appearance, again disappeared.

Finally, the symptoms dependent upon incurable organic change (cerebral softening, etc.) increased in severity, and the patient died in a state of coma.

On post-mortem examination, various patches of softening, gummy tumours, and other recognised appearances of advanced organic change depending upon syphilis, were found in the brain and its membranes. When the changes caused by a syphilitic affection are so grave as those in this case, nothing, of course, can be hoped for as the result of treatment beyond the amelioration of the patient's condition.

The above is interesting, under the circumstances of the present paper, as completing the series with an example of a case utterly beyond the power of physic to cure. The symptoms of such a case at once preclude hopes of recovery—an important distinction, because a false diagnosis as to the possibility of recovery is apt to throw discredit on a mode of treatment which may be of the greatest avail in cases of a less hopeless nature.

I would, in conclusion, submit that the foregoing cases show—

How the impairment of the general constitutional stability by syphilis, as by any other disease, may produce such a state of mental incompetence as to occasion insane manifestations.

That it is of the greatest importance to distinctly diagnose the true cause of the insanity, in order that an availing method of treatment may be resorted to.

That the patient's natural disposition, and the special nature of the exciting cause, exercise a determining and suggestive influence as to the form of insane manifestation displayed by him.

And, finally, that in those cases where the bodily disorder is acute, and the constitution not too severely affected, a complete recovery of the mental powers is to be hoped for on the disappearance of the syphilitic disease; while, in many chronic cases, such as the second and third of the series, where such a result cannot be hoped for, a comparative immunity may be procured for the patient from his more distressing mental symptoms by judicious treatment; but to this end a constant medical supervision is necessary.

In cases such as the last of the series, hopeless as they may be in regard to a re-establishment of the mental powers when great structural changes have occurred, much may be done to ameliorate the patient's condition and mitigate his sufferings.

ARTICLE VIII.—*On the Treatment of Dilatation of the Stomach by the Method of Kussmaul; with Cases.* By J. O. AFFLECK, M.D., Assistant to the Professor of Medical Jurisprudence in the University of Edinburgh.

(*Read before the Medico-Chirurgical Society of Edinburgh, 3d April.*)

To modern clinical and pathological investigation we owe much of our present knowledge respecting the diseases to which the stomach is liable. In the diagnosis of many of these diseases special difficulties have always been felt, in consequence of the strong resemblance, as regards symptoms, of morbid states of the organ, which, in their real nature, differ widely from each other. Hence, no doubt, the term "dyspepsia" came to be applied to a large and ill-defined class of affections of the digestive system—among which, however, recent inquiries have succeeded in identifying some important diseases of the stomach. Much is still to be desired in the way of an accurate classification of gastric diseases, as upon this, in large measure, must depend their rational and effective treatment.

The morbid condition known as dilatation of the stomach has been long recognised, and its causation pretty well determined. Without reference to those very rare instances of its occurrence, apart from any evidence of previous affection of the stomach, by far the greater number of cases which come under observation owe their origin to some form of disease which has resulted in a stricture of the pyloric orifice. Such stricture may be produced in various ways; as, for example, by the pressure of tumours, by thickening of the tissues of the stomach around the pylorus, due either to cancerous growth or to simple induration, the result of chronic catarrh; or, again, the pyloric orifice may be narrowed in consequence of the cicatrization and puckering of ulcers seated in its immediate vicinity, and this appears to be the cause of a large proportion of the cases which come under our notice. Although, then, dilatation of the stomach may be regarded less as a distinct disease than as one of a series of morbid phenomena or results arising from some pre-existing lesion, it yet presents features peculiar to itself, and requires treatment irrespective of its associations. When from any cause a stricture of the pylorus has occurred, and as yet no increase in the normal size of the stomach has taken place, it might be held that a condition analogous to dilatation of the organ has already been established, since the proportion between its cavity and its outlet has become changed. But it is only for a short time that the parts can remain in this relation, and results more positive very speedily arise. To overcome the obstacle presented to the transmission of its contents, the stomach must, if possible, act more powerfully, and, in some rare instances, it proves equal to the demand by a compensating hypertrophy of its walls. Most commonly, however, it is otherwise, and dilatation, without or with little hypertrophy, occurs—a result to be ascribed not merely to the distension of the organ by the mass of its contents detained for an undue length of time in its cavity, but also to the debilitated state of the walls of the viscus by previous or existing disease. This state of dilatation may exist, as is well known, to an enormous extent, and the outline of the stomach may be traceable over the whole front of the abdomen, causing the hepatic dulness to disappear, and extending as far down as the pubes. Although no constant relation has been found to exist between the degree of constriction of the pylorus and the extent of dilatation of the stomach (for the pyloric orifice may be but slightly contracted while the cavity of the stomach is largely dilated), yet it is certain that the wider the organ is expanded the less muscular power it will possess for the propulsion of its contents. The consequence is, that only a small portion of the food taken passes into the duodenum, the greater bulk being retained in the stomach, where, in circumstances the most favourable, it speedily undergoes putrefactive and fermentive changes, attended with the formation of various gases and acids, and the abundant development of torulæ and sarcinæ. This decomposing mass is highly irritating to the surface of the stomach, and appears to induce a state of chronic catarrh, accompanied with the abundant secretion of a vitiated mucus which still further increases the existing evil.

The symptoms to which this state of things gives rise are of the most severe character. As the stomach becomes distended with its putrefying contents, violent pain and heartburn, attended with foul eructations, begin, and soon the distress of the patient becomes extreme. Vomiting either comes on spontaneously or is induced by the patient himself tickling his fauces. The quantity vomited is usually very large, and consists of brown-coloured, offensively-smelling, and strongly acid matter, the decomposing food and mucus already described. Upon the surface a pellicle or froth collects, in which may be detected, on microscopic examination, torulæ and sarcinæ in abundance. The vomiting affords but partial and temporary relief, for the attacks of pain and heartburn recur at longer or shorter intervals, frequently within a few days, and again the stomach has to be emptied. The effect upon the patient is most marked. He becomes emaciated and anæmic—in fact, he undergoes a kind of slow starvation, while at the same time he becomes a prey to extreme despondency respecting his condition. His strength slowly declines, his limbs become œdematous, and, although life may be protracted for years, he ultimately dies of inanition. In most cases there is obstinate constipation, and the urine is much diminished in quantity, alkaline, and loaded with phosphates.

The treatment of this malady has received considerable attention, and many varied remedies have been suggested for its alleviation—its cure being generally held to be unattainable. Some physicians, having regard to the enfeebled state of the organ, and its diminished power of digestion, have sought to meet the indications for treatment by administering food in the smallest possible quantities consistently with the maintenance of life. This method, which is eminently a rational one, is occasionally followed with marked benefit when it can be rigorously carried out, which, however, is but seldom; for, to say nothing of the difficulty of ascertaining the exact amount of aliment capable of being digested, and keeping within this limit, there is the more formidable one of securing the patient's submission to this severe regimen for a length of time, without which, of course, the object in view is defeated.

Another plan of treatment, also occasionally beneficial, is that of placing the patient upon a diet of animal food, as being less likely to undergo the acid fermentation to which farinaceous food is liable, and, at the same time, more readily digestible in the stomach. With this view beef-tea, pounded meat, and even preserved meat, have been recommended and used with good effect. Further, efforts have been directed to the prevention or arrest of the fermentive processes by the administration of antizymotics, amongst which may be mentioned as of apparent value sulphurous acid, the alkaline sulphites and hyposulphites, chlorine water, creosote, etc.; and, whatever the nature of its action, there is no doubt that the green iodide of mercury often proves highly beneficial in cases of sarcinous vomiting.[1]

It must, however, be admitted, that the various remedies now mentioned have little more than a merely palliative effect, and the disease has come to be generally regarded as intractable.

In 1867, Professor Kussmaul, of Freiburg, brought forward[2] the method of treating this disease which has since received his name, and which has proved to be of signal efficacy. It consists in the employment of the stomach-pump for withdrawing the fermenting and irritating contents of the stomach, and for washing out the organ with some mildly alkaline solution. Convinced that the continual distension of the stomach by the mass of its undigested contents entailed a state of exhaustion of its muscular coats in their ineffectual propulsive efforts, while it tended directly to increase the dilatation of the organ, and to maintain a constant state of irritation or catarrh, Kussmaul perceived the prime indication to be the removal of this distension. The case which first led him to employ this ingenious device was that of a female, aged 25, who had long suffered from dilatation of the stomach, probably depending on an ulcer near the pylorus, who had daily attacks of severe pain and vomiting, and had become greatly emaciated. After the employment of the usual medicinal and dietetic remedies without success, it occurred to Kussmaul that if the stomach could be thoroughly emptied, which he observed was never accomplished by the most severe vomiting, its walls might be restored to a condition of health, and its dilated cavity be reduced. After passing the stomach-tube and completely emptying the stomach, Vichy water was pumped in and drawn out again, and thus the organ was well washed out. For two days there was complete relief, and on the reappearance of the symptoms the process was repeated and continued at intervals of two or three days. In a fortnight there was a most striking improvement in her whole condition. The evidence of dilatation of the stomach could be no longer recognised. In two months she had gained 15 lbs. in weight; in six months 23–24 lbs., and soon became quite well. At the end of two years there had been no return of her former symptoms.

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[1] The consideration of the much-discussed question of sarcinæ does not belong to a paper such as this. Among the most recent views entertained on the subject are those of Dr Ferrier, who, as the result of his investigations, holds sarcinæ to be a constant occurrence in the blood of man and the lower animals; and those of Professor Bastian, who believes sarcinæ to be of the nature of concretions, and capable of being developed not merely in the blood but likewise in certain saline solutions. (*Vide* Brit. Med. Journal, 27th Jan., and 4th Feb. 1872.)

Although the presence, in great quantity, in the stomach, of sarcinæ is a very frequent occurrence in cases of stricture of the pylorus, yet their occasional absence in well-marked examples of that disease seems to show that they bear no necessary relation to it, nor require any special treatment apart from that of the condition in which they occur.

[2] At the "Versammlung Deutscher Naturforscher und Aerzte," held at Frankfurt in September 1867.

This case was followed by several others of a similar nature in Kussmaul's clinique, where the same method was adopted, with, in some instances, complete cure, and in others with such a mitigation of the symptoms as had not been achieved by any other treatment previously employed.[1]

This plan was received with general favour in Germany, and was employed at various hospitals with marked success. In this country the observations of Kussmaul, and others who have followed his treatment, have been brought under notice by Professor Cuming, of Belfast,[2] but nevertheless the method appears to have been little employed here.

In the two following cases recently under treatment in Ward VI. of the Royal Infirmary (under the care of Prof. Maclagan), I had an opportunity of employing and noting the results of Kussmaul's method:—

CASE I.—Robert J., æt. 36, engine-driver, residing in Glasgow, was admitted to the Infirmary on 3d August 1871, complaining of frequently recurring attacks of vomiting accompanied with severe heartburn and pain in the stomach. The note sent by his medical attendant stated that he was suffering from symptoms of stricture of the pylorus.

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[1] Ueber die Behandlung der Magenerweiterung durch eine neue Methode mitteltst der Magenpumpe; von Dr A. Kussmaul. Deutsches Archiv für Klinische Medicin, Dec. 1869.

[2] Dublin Quarterly Journal of Medical Science, Nov. 1870.

The patient states that for above a year he had suffered from a weak stomach, his food often disagreeing with him; but that about eight months ago he began to be troubled with foul eructations after meals, accompanied with severe pain, and ending in two or three days with vomiting. He would vomit three times in the course of one day, then there would be an intermission of three or four days, when the vomiting again came on. The vomited matter was dark-coloured, intensely sour, and had an offensive smell. There was always severe burning pain in the epigastrium before vomiting. He had never at any time observed blood in the matter vomited. He tried to live on the lightest diet he could think of, but with no effect; and under the constantly returning attacks of pain and sickness, he became so weak that he had to cease working in the end of January, since which time he had been more or less under medical treatment.

His previous health had been always good and his habits temperate. Had not been a great eater. Family history good.

Present Condition.—Patient is 5 ft. 10 in. in height, of large frame, but emaciated. His weight is 9 st. 4 lbs. Complexion sallow, and aspect dejected.

Nothing abnormal could be discovered in the thorax.

Digestive System.—Tongue coated with a brownish fur; appetite bad; no thirst; bowels irregular, being for the most part much constipated. On inspection, there is in the epigastric region, when patient is in the recumbent posture, slight bulging, which extends below the umbilicus when he stands. On palpation there is no tumour nor any tenderness in the epigastrium. The abdominal parietes are soft and thin, and on pressure with the hands fluid can be felt passing across the abdomen superficially as if within a distended stomach. On percussion, the whole front of the abdomen is tympanitic, and the hepatic dulness is diminished.

Genito-urinary System.—Urine about 30 ounces; sp. gr. 1031; slightly alkaline, deposits phosphate of lime on standing.

Nervous System.—Sleeps badly; no headache; very desponding as to his hope of recovery.

Diagnosis.—Pyloric constriction and dilated stomach.

Prognosis.—Doubtful.

Treatment and Progress.—5th Aug.—Patient vomited a large amount of most offensive brown-coloured material, with a thick froth on its surface. This on microscopic examination showed great quantities of sarcinæ ventriculi and torulæ. Ordered the rice diet of the hospital, consisting largely of milk; also acid. hydrocyan. ♏ij., in half an ounce of lime-water thrice daily, and a pill containing gr.j. of the green iodide of mercury thrice daily.

10*th.*—For past five days has not vomited, and feels somewhat better.

12*th.*—Suffering from epigastric pain, and vomited some sarcinous matter. As his gums were slightly affected, the pills were discontinued. Urine reduced to 20 oz. in the twenty-four hours.

17th.—Again vomited a large quantity of the same material as before. The smell of the vomit is so offensive, that the other patients complain that they can scarcely remain in the ward. Ordered ten-grain doses of the hyposulphite of soda thrice daily.

19th.—Vomiting still continues; the dose of the hyposulphite of soda increased to 30 grains, and a teaspoonful of pepsine wine to be taken with his food.

25th.—To-day patient again vomited largely.

29th.—Had another severe attack of vomiting last night. Ordered gr. x. of bismuth to be taken with ♏ij. of hydrocyanic acid in mucilage every four hours.

8th Sept.—For eight days patient kept free from vomiting till last night and to-day, when it returned as severely as before. He is extremely desponding, and has become much weaker of late, his weight being only 9 stone.

9th.—To-day the stomach-tube was passed, and the contents of the stomach pumped out, tepid water being also thrown in and drawn off again, so as completely to empty the organ. Then about 16 oz. of aerated potash water were run in by attaching the syphon bottle to the end of the stomach-tube,[1] and the greater part drawn out again, a little being purposely left to remain in contact with the stomach. Patient felt considerable relief after this.

10th.—Very slight vomiting to-day.

11th.—Stomach-pump used as before, except that Condy's fluid was added to the tepid water to keep down the fetor.

14th.—The treatment continued. Has not vomited for four days, and feels better. Has not slept so well since he became ill, as he did last night.

25th.—The stomach-pump continues to be used daily. The patient never vomits now; he eats well, is cheerful, and feels in every respect better than he has done since he took ill; can now take a long walk; has gained 6 lbs. in weight within a fortnight. The contents of the stomach still show sarcinæ. His urine is still scanty, and his bowels constipated.

2d October.—Treatment continued as before, except that a weak solution of bicarbonate of soda has been substituted for the aerated potash-water. Never vomits, and is still gaining weight.

9th.—The stomach-pump is still employed daily. Sulphurous acid is used with the tepid water instead of Condy's fluid. No vomiting; and very few sarcinæ are now to be observed in the contents of the stomach. He now weighs 9 st. 13 lbs., being a gain of 13 lbs. since the stomach-pump was resorted to a month ago. Urine now between 30 and 40 oz. daily. Bowels moved only by laxatives. Takes the bismuth mixture occasionally. The improvement in his condition, bodily and mental, is very marked, and he is daily gaining strength.

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[1] The suggestion of one of the clinical clerks, Mr J. M. Brown, who, along with Messrs Donald, Robertson, and Huggins, the other clerks, rendered great assistance in carrying out the treatment.

16*th.*—Improvement goes on rapidly; weight 10 st. 3 lbs. Says he never felt better in his life. Treatment as before.

19*th.*—Patient is now so well that he is to-day dismissed to the Convalescent House, with instructions to call every second day at the Infirmary, that the stomach may be pumped if necessary. No sarcinæ can now be seen in the contents of the stomach withdrawn by the pump.

21*st.*—Came in to-day. Continuing better.

26*th.*—Did not come in again till to-day, feeling so well. Stomach-pump used, but patient thinks it is now unnecessary. Appetite ravenous, and bowels now move without medicine.

9*th November.*—Dismissed to-day, feeling quite well. His weight, taken before he left, was 10 st. 7 lbs.

About a month after his return home, he wrote, stating that he still continued to improve, and that he had provided himself with a stomach-pump, which he used occasionally.

On 17th January last, in answer to my inquiry, he wrote, stating that he was now as well as ever he had been in his life; that he had not required to use the stomach-pump for more than a month, and could now eat anything; also, that he had returned to his full duty as an engine-driver. On the following day, he came into Edinburgh and called at the Infirmary. He has the appearance of perfect health, and now weighs 11 st.; is never at all troubled with his stomach. In the end of March, I again inquired for him, and he wrote to me in exactly similar terms to the above, stating, also, that he could do both day and night duty, and that his weight still kept up to 11 st.

CASE II.—Alexander E., æt. 42, farm-labourer, East Lothian; admitted to the Infirmary on 11th August 1871, complaining of frequent fits of severe pain in the stomach, acidity, vomiting, and great loss of strength.

This patient dates the commencement of his illness as far back as ten years ago, when he suffered much from burning pain in the stomach, unaccompanied with vomiting. This gradually wore away. About three years subsequently, he was again laid up with the same symptoms; but on this occasion there was severe vomiting, for which he was under treatment for a short time in the Infirmary. The symptoms gradually subsided, but recurred about three years later, and again in the autumn of 1870. On one occasion, the vomit was said to have contained blood. During the intervals of the attacks, he enjoyed, he states, tolerable health, but was not so strong as before his stomach complaint began.

His present attack commenced about two months previous to his admission, with severe burning pain in the stomach, partially relieved by vomiting, which occurred at irregular intervals of a few days, the vomited matter being sour, black-coloured, and frothy.

The patient is a tall, feeble-looking man, very anæmic and emaciated. His pulse at the wrist is almost imperceptible.

Digestive System.—Appetite bad; tongue clean; complains of a burning pain about the ensiform cartilage, extending to the right and left of this spot. There is tenderness, on moderate pressure, over the epigastrium. The stomach can be made out as extending over nearly the whole front of the abdomen. Its contour, when distended with food or fluid, can be traced distinctly in the hypogastric region. On palpation, a splashing sound is heard through the thin abdominal parietes, resembling that elicited on pressing a half-filled water-cushion. The hepatic dulness is almost obliterated. Bowels intensely constipated.

Genito-urinary System.—Urine about 30 oz.; neutral; no albumen; sp. gr. 1012.

Nervous System.—Sleeps badly; is listless and low-spirited.

Diagnosis.—Gastric ulcer; stricture of pylorus and dilatation of stomach.

Prognosis.—Unfavourable.

Treatment.—On admission, was ordered—℞ Acid. hydrocyan. dil., ʒss.; bismuth. subnit., magnes., āā ʒij.; glycerin., ℥i.; aquam ad ℥vi. M.—Sig. ℥ss. ter die; and, on the following day (12th August), a pill containing 1 grain of green iodide of mercury, and one-third of a grain of opium, thrice daily; also rice diet.

15*th August.*—Vomited a large quantity of dark-coloured, intensely acid, and frothy matter, in which a few blood-clots were observed. Torulæ and sarcinæ were detected in great abundance.

25*th.*—Rather better. No vomiting for past ten days. He is, however, extremely weak, and œdema of feet and ankles has recently appeared.

30*th.*—Still free from vomiting, but no increase of strength. Œdema of feet continues, and there are now profuse nocturnal perspirations.

1*st September.*—Has had diarrhœa, which was checked by pil. plumb. c. opio.

8*th.*—Suffering from epigastric pain. Vomited to-day. The medicines continued.

12*th.*—Severe epigastric pain continues, and causes him to lie on his face, with his knees drawn up. Vomited yesterday an enormous quantity of dark-coloured sarcinous matter. Urine diminished to about 15 oz. in twenty-four hours; alkaline, and depositing phosphates. Ordered ten-grain doses, thrice daily, of ferri et ammon. citr.

14*th.*—Vomited again to-day, and is suffering great pain in the stomach.

19*th.*—Passed a very bad night, and to-day vomited an immense quantity. He is fast losing strength, and is almost wholly confined to bed.

24*th.*—No vomiting for five days, but heartburn and pain has again begun.

26*th.*—Yesterday and to-day the stomach-tube was passed, a little water containing sulphurous acid injected in, and withdrawn along with the contents of the stomach. A weak solution of bicarbonate of soda was then used to wash out the stomach, as in Case I. Patient felt relief on both occasions, and has slept better.

2*d October.*—To-day traces of blood were observed in the contents of the stomach withdrawn by the pump.

16*th.*—The stomach-pump continues to be used daily. Patient looks better, and feels stronger. His weight, however, still remains the same—scarcely 10 st.

7*th November.*—Feels decidedly better, and is much improved in spirits. Stomach-pump continued daily.

23*d.*—Progressing favourably. Has occasional attacks of heartburn, and has vomited once during the past month; but he obtains instant relief on the application of the stomach-pump, which continues to be used daily. Never has the attacks of pain he had before; is cheerful, and can take a long walk. Feels stronger than for many months before his admission. No increase in weight, and urine still scanty.

21*st December.*—The treatment by the stomach-pump continues to be followed with good effect, the patient's whole appearance betokening improvement. Has lost his anæmic look, and the œdema of his ankles is gone. No pain nor uneasiness about the stomach; eats and sleeps well. Weight continues the same. Urine now about 40 oz.; alkaline. Bowels very constipated.

11*th January* 1872.—Feels so well that he is desirous of returning home, as he thinks the country air would completely restore him.

1*st February.*—About the time the patient was to have returned home, he was seized with a severe attack of erysipelas of the face and scalp, which caused him much pain, and greatly reduced his strength. During the continuance of the erysipelas, did not suffer from his stomach, but he was taking very little food.

12*th.*—Has had a second attack of erysipelas. During the whole time, on this as on the last occasion, the gastric symptoms have remained in abeyance.

3*d March.*—Has been slowly recovering strength since the last attack of erysipelas. The stomach-pump has now to be used only once in four or five days, and much less is brought up from the stomach than ever before. Sarcinæ still to be found.

16*th.*—Has greatly improved within the last ten days; can go out and walk about as well as before the attacks of erysipelas. Is now passing about 60 oz. of urine, of light specific gravity. Is evidently digesting his food, as he has no feeling of distension after eating, and the stomach-pump has not been required for a fortnight. Is to return home in a week.

18th.—Felt some acidity to-day. Stomach-pump used, but was accidentally broken in working. He then vomited a considerable quantity.

23d.—Has vomited once or twice since last report, the stomach-pump not being at hand, but to-day feels much better. Has procured an instrument for himself, to be used at home. In accordance with previous arrangements, he left the Infirmary to-day.

30th.—As he had not left town, I called on him to-day, and found him continuing better. Has been free from pain and vomiting for ten days. His urine continues abundant.[1]

These two cases differ in many respects from each other, but they correspond in one point—viz., the evidence each gave of the presence of a stricture of the pylorus, with resulting dilatation of the stomach.

In the first case there was no good ground for believing that the patient had suffered from gastric ulcer, the whole history of his illness corresponding rather with that of a chronic gastric catarrh, which had caused thickening of the tissues in the neighbourhood of the pylorus. However distressing and urgent the symptoms in this case were—and they were sufficiently so to make the prognosis an uncertain one—yet the fact of the recent development of the disease still warranted the hope that the muscular structure of the stomach had not become so exhausted by distension as not to recover tone when the pressure was removed—a view amply confirmed by the result. The evidence of the restoration of normal digestion and absorption in the marked gain in weight, the regulated condition of the bowels, and the increased secretion of urine, proved that, to a great extent, the stomach had recovered its propelling power, and its mucous membrane been restored to a condition of health. And it is to be observed that this improvement dated from the time that the treatment by the stomach-pump was begun, previous to which no amendment had taken place. Had anything further been wanting to demonstrate the benefit derived from the treatment, it would have been furnished in the complete restoration of the patient's mental health.

The second case was a much less promising one than the first, owing to the long duration of the disease, the extent of dilatation of the stomach, the evidence of ulceration, existing as well as past, and especially to the state of exhaustion to which the patient was reduced. On this account, some hesitation was felt in resorting to the method of Kussmaul with him. Notwithstanding this, it is certain that here, too, the use of the stomach-pump was soon followed by a marked amelioration in the more urgent symptoms;

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[1] He returned to the country soon after this, and on 22d April he wrote to me, stating that he continued better, having had no vomiting, nor any occasion to use the stomach-pump, since he left Edinburgh. His weight (which was reduced to 9 st. 2 lbs. after the erysipelas) is now 10 st. 5 lbs.

and while the result was less satisfactory than in the former case, there is no doubt that by this means the patient's life was preserved and rendered capable of being maintained in comparative comfort. From the long duration of the symptoms, and the enormous expansion of the stomach, there was reason to fear that in this case the muscular structure of the organ had become so impaired by atrophy or degeneration as to exclude the hope of a cure. Cases of a similar nature are recorded by Kussmaul, who regards them as among the incurable forms of the disease, but nevertheless capable, many of them, of decided benefit under his method of treatment. In the case of E., the evidences of improvement under this treatment were sufficiently marked to hold out the prospect of still further amendment by perseverance in its employment. Among these evidences, great importance is, I apprehend, to be attached to the restoration of the urine to its normal quantity and character, as indicating that the mucous membrane of the stomach was in a healthier condition, and able to absorb fluid to a much greater extent than before.

To state, then, briefly, the advantages of this plan of treatment:—It cannot remove a stricture of the pylorus: its action is essentially upon the muscular structure and mucous membrane of the stomach. The complete removal of the contents distending its cavity, which can only be effected by mechanical means, enables the muscular coat of the organ to recover its contractile power, just as the use of the catheter in certain cases of retention of urine is followed by a similar result; while the subsequent application to its mucous membrane of the mildly alkaline solution subdues the state of catarrh.

The cases most favourable for its employment are manifestly those of recent development where no great change of structure has had time to occur. And yet a reference to the large experience of Kussmaul,[1] of Niemeyer,[2] and of others who have used this method of treatment, will furnish several instances of complete cure in cases of many years' duration, where all the signs and symptoms were present in the most aggravated form. Further, in the most hopeless cases, as for instance in cancerous stricture of the pylorus, marked relief has been derived from the employment of the stomach-pump.[3]

Some objections to this method of treatment can only be very shortly noticed. The annoyance connected with the passing of the stomach-tube is a practical difficulty of considerable weight, and there can be no doubt that, in the case of some sensitive persons, it would be sufficient to deter them from submitting to the treatment. With most, however, no unpleasantness is felt after the first or second passing of the instrument, and they cheerfully submit to what they feel procures them so much relief. In the above two cases no difficulty was experienced from this source, and soon each patient came to pass the tube for himself with greater facility than it could be done for him. Again, the risk of injuring the stomach by sucking in a portion of its mucous membrane into the orifice of the tube, has been mentioned as an objection to the plan. This, however, is but a doubtful source of danger, and could scarcely occur unless an unwarrantable amount of force were employed in working the pump. Particular attention was directed to this in both the cases now narrated, but on no occasion was the operation followed by pain, or any indication of local injury, but, on the contrary, always with relief. To obviate, however, any such evil, as well as to simplify the operation, it has been proposed to substitute for the pump an adaptation of the syphon principle. This modification of Kussmaul's method was first brought into notice by Professor Jürgensen of Kiel,[1] and a special instrument for the purpose was devised by Dr Rosenthal of Berlin.[2] This syphon arrangement has now, on the Continent, to a large extent replaced the use of the pump in emptying and washing out the stomach. While it may be doubted whether it accomplishes the object as effectually or as expeditiously as the pump, it has decided advantages to the operator, and is exceedingly simple in its application. The principle, however, is precisely the same in both. Lastly, it may be objected that the treatment by Kussmaul's method, while applicable enough in hospital practice, can scarcely be carried out in private. The two cases now narrated furnish a sufficient answer to this. Both the men of their own accord procured stomach-pumps for themselves, and had them used at home—a proof, it may be further remarked, of the value they set upon the treatment, as well as of the benefit they had derived from it.

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[1] Kussmaul, loc. cit.

[2] Berliner Klinische Wochenschrift, 3d January 1870.

[3] Do., loc. cit. Dr Wm. Pepper of Philadelphia, quoted in "New Remedies" for July 1871.

In submitting these two cases to the notice of the Society, I venture to hope that they may be not without interest as additional testimony to a method of treatment the value of which has already been well established. Without unduly estimating that value, and still less depreciating other remedial measures, the treatment now described offers more successful results than had hitherto been obtained in dealing with this formidable malady, and may be justly claimed as an important advance in the therapeutics of gastric diseases.

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[1] Deutsches Archiv f. Klin. Med., 1st April 1870.

[2] Figured and explained in Berliner Klin. Woch., 13th June 1870.

Part Second.

REVIEWS.

A Dictionary of Chemistry and the Allied Branches of other Sciences. By HENRY WATTS, B.A., F.R.S., F.C.S., etc. Supplement. London: Longmans: 1872.

THIS supplementary volume fully sustains the high character of Watts's Dictionary as a trustworthy record of chemical facts and opinions; and the English chemist has now, in the comparatively small space of six thick octavo volumes, a succinct and, generally speaking, accurate account of everything known in chemistry down to the end of the year 1869, along with the references necessary for the verification of each abstract, and for obtaining full details of each investigation.

These six volumes serve two distinct purposes: first, they form a book of reference for those who do not require more than the condensed and abstracted notices which it contains; and, secondly, they form an index to the enormous mass of original research, the detailed records of which are scattered through numerous journals and publications of learned societies.

The labour of collecting these scattered materials, of comparing and condensing them, is of course very great, and the highest credit is due to the editor, who has himself written a large part of the book, and to the various contributors who have assisted him, for the remarkable rapidity of publication, and for the general correctness of the abstracts.

We have said that the rapidity of publication is remarkable. This will be best seen by comparing it with the rate of publication of its great prototype, the German "Handwörterbuch der reinen und angewandten Chemie." The first volume of Watts's Dictionary was published in 1863, and the fifth (completing the work of which the volume before us is a supplement) in 1868,—the whole Dictionary from A to Z being published in five years. The first volume of the "Handwörterbuch" appeared in 1837, and the ninth and last in 1864,—twenty-seven years being thus occupied by the publication of the entire work. It is, however, only fair to state, that, by the publication of a second edition of the first two volumes, the interval between the oldest and newest articles in the Handwörterbuch is greatly reduced. Thus, if we form one book of the second edition of vols. i. and ii., and the first edition of the remaining seven, the oldest volume is vol. iii., 1848, and the most recent, vol. ix., 1864—reducing the entire period to sixteen years, as against five in the case of Watts's Dictionary.

The advantages of rapidity of publication are obvious. It is of course in the highest degree desirable that such a book should all belong to one epoch, that views adopted in the first volume should not be matters of antiquarian curiosity at the date of the last, and that nomenclature and notation should not undergo fundamental changes from volume to volume. Even Watts's Dictionary has not been published fast enough to avoid altogether the evils just mentioned. Thus, in the article "Atomic Weights," objections are stated to the large atomic weights proposed for certain metals by Cannizzaro, and a table is given in which *only* the small atomic weights of these metals appear. Accordingly, in the early part of the alphabet (Aluminium, Barium, Cadmium, Calcium, Chromium, and Cobalt) only the small atomic weights are mentioned. With Copper we begin to find the large atomic weight mentioned, but only used in formulating the cuprous compounds; with Iridium and Iron we arrive at a stage where both systems are used throughout; this lasts as far as Nickel; from Osmium onwards to Zinc, the new system (that of Cannizzaro) is exclusively used. Thus, the compounds of Barium and Cadmium are formulated in a totally different way from those of Strontium and Zinc, and the comparison of these series of perfectly analogous compounds is rendered impossible, except for those who are acquainted with the history of the revolution which took place between vol. i. and vol. iv. The opportunity of explaining these discrepancies given by the publication of the Supplement has unfortunately not been taken advantage of. In the Supplement the new system is used without explanation.

Such cases are rare, and their more frequent occurrence has only been avoided by rapidity of publication. This has, however, led to a blemish of another kind, which we think it is right to notice. A compilation or condensation of the nature of the "Dictionary" ought to be compiled and condensed *from the original materials*, not from previous compilations or abstracts; these should be used as indices only.

The articles in the "Dictionary" contain internal evidence that in many cases the original materials have been used, but there are frequent indications of second-hand reference, and of research not extending beyond the "Jahresbericht" or the "Handwörterbuch." These are, no doubt, generally trustworthy sources of information, but the repetition of the abstracting process introduces a considerable risk of error.

The book is, on the whole, so good, and so useful and popular, and the Supplement is so sure to add to its usefulness and popularity, that we have felt impelled to pick a few holes in it. Notwithstanding the flaws, which we flatter ourselves that we have, after diligent research, succeeded in detecting, we cordially recommend the "Dictionary" to all who wish either a handy book of reference, or a means of referring to original papers.

A Treatise on Diseases of the Nervous System. By WILLIAM A. HAMMOND, M.D., etc. New York: D. Appleton and Co.: 1871. Pp. 754.

Studies on Functional Nervous Disorders. By C. HANDFIELD JONES, M.B. Cantab., F.R.S., etc. London: J. Churchill and Sons: 1870. Pp. 839.

Dr HAMMOND'S work is based mainly on his own observations and experience, and conveys also his own views, which differ in some respects from those of others. It is, however, none the worse for this, for even erroneous views distinctly uttered lead to inquiry and consideration, and are for this reason often of more importance for the advancement of medicine than an unmeaning and parrot-like repetition of the actually more correct views of previous observers. Brevity and explicitness are the characteristics of this volume, which has no pretensions to be an exhaustive treatise on the subjects contained in it. But with all this conciseness, it is the most complete treatise on diseases of the nervous system in the English language, and its very brevity makes it all the more applicable to the wants of the practitioner, for whose use also the clearness as to points of diagnosis and the explicit directions for treatment still further recommend it.

The introductory chapter describes the instruments and apparatus employed in the diagnosis and treatment of nervous disorders, and the rest of the work is divided into five sections, which treat successively of diseases of the brain, of diseases of the spinal cord, of cerebro-spinal diseases, of diseases of nerve-cells, and of diseases of the peripheral nerves. When so much is attempted in so short a space, it is of course needless to expect all the articles to be of equal value. The chapter on Neuralgia, for instance, might almost as well have been wholly omitted; it is meagre in the extreme, and its directions for treatment too brief to be of any but the most trifling value. Again, however satisfactory it may be to find insanity duly recognised as a symptom of nervous disease, the chapter on it, too, is so bald as to be of neither scientific nor practical value. Nevertheless, as a comprehensive treatise on nervous disorders in small bulk, this work deserves to find a place in the book-shelves of every practitioner, and much useful information will be found in it which is otherwise unattainable without wading through a great deal of literature of a cumbrous quality.

Dr Handfield Jones's first edition has already been favourably noticed in this Journal (Nov. 1864), and we gladly welcome a second edition, which, however, has unfortunately greatly increased in size. It is full of valuable practical information, and its physiology and pathology, we need not add, are quite abreast with the modern advances of these sciences.

The Origin of Cancer, considered with reference to the Treatment of the Disease. By CAMPBELL DE MORGAN, F.R.S., Surgeon to the Middlesex Hospital. Reprinted in part from the *Lancet.* Pp. 88. J. and A. Churchill: London: 1872.

THIS is a very interesting and most thoughtful tractate on a most important subject. Dealing rather with principles than with details, it is meant to stimulate thought and evoke discussion rather than merely to dogmatize or convey information.

The special opportunities given to the surgeons of the Middlesex Hospital for the study of cancer in all its stages, by the special cancer wards of that institution, have borne noble fruit in the pathological papers, not only of Sir Charles Bell, but of Moore and De Morgan in later times; and it is encouraging to find the teaching of this school ascribing a local origin to cancer, and that, notwithstanding the constant presence in their wards of exceptionally severe and incurable cases of cancer, the surgeons of the Middlesex still hold that, in its early stage at least, cancer is a local disease.

The immense difficulty of eradicating cancer once it has shown itself has impressed upon the majority of surgeons the belief that, in its essence, cancer presupposes, like gout, a special morbid condition of the blood which is antecedent to its own growth. Additional evidence of its constitutional character is found in its being so often hereditary, so frequently multiple, and so uniformly in its termination indicative of cachectic taint.

Mr De Morgan believes that these evidences, though strong, are not conclusive of cancer being a blood disease, but rather holds, "*cancer and allied diseases partake more of the nature of parasitic disease than of the results of previous blood-poison.*"—P. 6.

We cannot trace Mr De Morgan in the very able discussion of the characteristics of malignancy, the essentials of cancer, and the views of Simon and Paget as to relation between the tumour and the blood-poisoning, but we would notice the great interest of his observations on the rarity of the recurrence of primary cancer in the same organ, or in similar organs, and on the almost invariable robust health and absence of cachectic appearance of patients before the appearance of, and during the time of, *primary* cancer. —Pp. 13, 14.

Recurrence of simple tumours is not so rare as to render the recurrence of cancerous tumours in any way different except in degree. We can hardly go so far as Mr De Morgan, when he tells us that *the cancerous cachexia is the result for the most part of cancerous ulceration.*—P. 19.

The manner of recurrence of simple and malignant growths is discussed with much freshness and point. Some very interesting cases of reproduction of cancer from contact are given, in which pretty strong evidence of multiplication of cancer from actual spreading of cancer-germs is brought forward. This explains the wide spread of disease in the neighbouring parts whenever a cancer is cut *into*, instead of being cut out. An instance of this spreading is seen in the tubercles of cancer in the skin over a breast, and every experienced surgeon knows how hopeless an operation is in such a case.

Having, then, easy explanations of local recurrence in the three channels of lymphatics, bloodvessels, and interstitial cellular tissue, how, it may be asked, can we account for a merely local disease ending in simultaneous multiple growths in different parts? This is a knot which our author cuts rather than unties, by asking how can it be proved such cases really occur at all, for how can it be shown that in no part of the body was there a tumour existing before these multiple ones appeared?—P. 32.

Why, then, do cancers recur so frequently? Their juice is easily carried away; they recur in young people in whom vital action is active, and whose tissues are lax. The elements of a cancerous tumour are loosely heaped together, hence easily scattered, and their low vitality is tenaciously maintained.

As to the cancerous cachexia, Mr De Morgan does not think it an evidence of the primary seat of cancer being in the blood, but merely a result of the absorption of the foul discharge from the cancerous ulcer. When we add to this the pain, the mental distress, the hopeless future, the foul odour, we cannot wonder that health, bloom, and weight rapidly deteriorate, even without any presupposed blood disorder.

What, it may be asked, is gained, supposing these views are established? Expectancy, regimen, and drugs, will no longer have any excuse for their use; local treatment only will be used. All medicines are useless and hurtful, as wasting time; only two courses remain—leave the tumour to run its course, or extirpate it as completely as possible, as soon as possible.

The indications for and against operation in doubtful cases are well given, and the relative merits of the knife and caustics discussed most sensibly.

We are surprised that Mr De Morgan gives the credit of the sulphuric-acid treatment to Michel of Paris. Syme practised and taught it in suitable cases so long ago as 1856.

The use of chloride of zinc in solution after operations for cancer, as introduced by the author, is founded on most rational principles. It is not only an admirable antiseptic, but also its use may kill any stray germs of cancer which may remain in the tissues, or may have got there during the operation.

A method of healing cancer by starving the patient has the great disadvantage, that in early cases it puts off time which would be better employed by operating at once, and in late cases is most likely to hasten the fatal issue.

We have rarely read a medical work of more interest, and containing so much thought, in so small space.

Earth as a Topical Application in Surgery: Being a full Exposition of its Use in all the Cases requiring Topical Applications admitted in the Men's and Women's Surgical Wards of the Pennsylvania Hospital during a period of six months in 1869. By ADMELL HEWSON, M.D., one of the attending Surgeons to the Pennsylvania Hospital. With four Photo-relief Illustrations. Pp. 309. Philadelphia: Lindsay and Blakiston: 1872.

THIS is rather a large book on a small subject; but the size of it is partly explained by the fact that all the cases treated by earth in six months are pretty fully detailed.

As is usual in the case of new or revived remedies, the merits are exaggerated, and the deficiencies ignored. A perusal of this work will leave the reader with an idea that dry earth in some cases, mud or clay in others, may be trusted as the only necessary contents of a hospital dressing-box. As a dressing, it, the earth, is deliciously cooling, relieves pain instantaneously, removes fœtor in the most rapid manner, etc., etc. A tolerably careful analysis of the ninety-three cases recorded has left us in the belief that the results are by no means good, that the trifling cases got well, as they always should do, but by no means quickly; that one excision of a breast, in a wiry old woman, healed quickly and well, but that another was an exceedingly slow and unsatisfactory cure; that two cases of wound of the knee-joint died; that of four compound fractures treated in their whole course by the earth, only one recovered; that of four amputations above the ankle, only one recovered; indeed, in general terms, that the results in the really serious cases were about as bad as possible. To one case we must draw attention, as being of so remarkable a nature as to tax our powers of belief to the utmost. At page 100, we are told that an *epithelial* ulcer of the face healed up under the use of earth from the patient's garden.

Dr Hewson has made out that earth is a deodorizer, a most valuable agent for destroying fœtor—he has not proved that it is an antiseptic. He states that it relieves pain in the most marked manner, when applied after a wound or an amputation; but then we know that the pain naturally ceases after a time, especially when aided (as in most of Dr Hewson's cases it was aided) by a hypodermic injection of atropia.

We believe Dr Hewson will tire of his panacea, as inventors (original or second-hand) have tired, and will tire, of their panaceas. Dry earth will be useful in some cases as a deodorizer, but will never be taken into general use as a dressing, from its clumsiness and difficulty of application.

As a means of removing odours from the hands it may be of use in dissecting-rooms, as it is in the latrines attached to them.

There is a long chapter on the *modus operandi* of the dry-earth dressing, in which we recognise a good deal of Mr Simon's paper on inflammation in the *first* edition of Holmes's Surgery, besides a great deal of most original theory, on the chemistry of the deodorizing power of earth, which our stupidity prevents us from criticising.

Four photo-relief illustrations which accompany the cases are most admirably executed, and give a most life-like representation of the patients.

Arsenal de la Chirurgie Contemporaine; Description, Mode d'Emploi, et Appréciation des Appareils et Instruments en usage pour le Diagnostic et le Traitement des Maladies Chirurgicales, l'Orthopédie, la Prothèse, les Opérations Simples, Générales, Spéciales, et Obstetricales. Par G. GAUJOT et E. SPILLMAN. Avec 1855 figures intercalées dans le texte. Tome ii. Par E. SPILLMAN. Paris: J. B. Baillière et Fils: 1872.

So long ago as December 1867, we reviewed at considerable length the first volume of this work in this Journal, and the appearance of the second volume at so long an interval, and under different authorship, has given us no reason to modify or tone down the very favourable opinion then expressed. M. Gaujot's other duties have prevented him from completing his great and laborious work; so he has left to his successor in the teaching department of operative surgery at Val-de-Grace the duty of writing the second part of the *Arsenal.* M. Spillman has endeavoured to follow the same arrangement and method which M. Gaujot had chalked out for himself. The volume is profusely illustrated, no fewer than 1445 woodcuts being arranged in its 1100 pages.

In the first 180 pages we have very full accounts of the approved prothetic apparatus of the oculist, the dentist, and chiefly of the maker of artificial limbs. The instruments described are chiefly of French origin, though Bly's leg and foot are figured. The rest of the work contains a description of all the instruments invented for operations of all kinds, even obstetrical ones. Many which are absurd and useless are figured and described, perhaps to prevent other people from re-inventing them. It is a work that will be useful to surgical teachers, and which certainly no instrument-maker, pretending to a knowledge of his art, should be without.

Photographic Clinique of the British Hospital for Diseases of the Skin. No. 1. Edited by BALMANNO SQUIRE, M.B., F.L.S., Surgeon to the Hospital.

OPINIONS may differ as to the permanent value of photographic portraits of skin diseases, but there can be no doubt as to the present value of this Number of this Photographic Clinique, which is an admirable illustration of oval or true keloid, the accompanying sheet of letterpress containing a succinct and valuable account of the disease, and of Mr Squire's experience in regard to it. The work, as we have already indicated, is to be obtained by subscription only. Subscriptions to be sent to 56 Great Marlborough Street, Regent Street, London, W.

Part Third.

MEETINGS OF SOCIETIES.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

SESSION LI.—MEETING III.

Wednesday, 20th December 1871.—Dr HANDYSIDE in the Chair.

The Chairman, after returning thanks for the honour conferred upon him, in a few appropriate words alluded to the progress made during the past half of this century in the furtherance of medical science, and hoped that now, the Society having entered on the 51st session of their existence, all their latent force would be called forth during the latter half of the century upon which they had now entered, for the accomplishment of those objects which it was the desire of the Society to promote.

The Chairman proposed that the time should be limited for the exhibition of pathological specimens, with remarks thereupon, and that, if possible, five minutes out of the half-hour should be reserved for the reception of medical news. If this met the approval of the Society, he would, at half-past eight, sign for the leading paper of the evening to be read.

The Chairman then called for the exhibition of PATHOLOGICAL SPECIMENS.

I. *Dr G. W. Balfour* then said, I have to show the Society a specimen, interesting not only in itself, but also in regard to its history.

The patient, James N., came under treatment three months ago, evidently suffering from spasmodic affection of the larynx, and acute disease of the lungs. From the latter he recovered, but he subsequently had repeated attacks of asphyxia, followed by copious expectoration of fluid. There was a slight difference on the two sides of the body, both in regard to the pulse and respiration. The right pulse was smaller and weaker than the left, and the respiration on the right side was feebler than that of the other. Both pupils and the voice were natural. On altering the position of the patient, there was no change in the respiration. Any tumour present was certainly not movable. An aneurism of the arch was believed to be the cause of the symptoms, but no positive evidence could be elicited, beyond slight accentuation of the aortic second. About a week ago the patient was seized with one of his attacks while I was making the visit. He became asphyxiated in a second or two, and I then noticed that respiration was equally diminished on both sides. He gradually became apparently moribund, and tracheotomy was performed as a *dernier ressort*, but without much hope of any relief; none occurred, and he very shortly afterwards died.

On post-mortem examination, an aneurism, the size of a small walnut, was found arising from the posterior part of the arch of the aorta. The arch itself was slightly dilated. The aneurism pressed upon the trachea a little above its bifurcation and to the right; a small clot adherent to the trachea occupied its posterior portion. In the natural condition the slight obstruction was more exerted, therefore, on the right bronchus; during any exacerbation, the dilatation of the tumour passed across the whole trachea, and obstructed both sides equally. The case in many points resembled much that of the late Earl St Maur, and its post-mortem result tended very strongly to confirm the accuracy of the diagnosis made by Dr Williams in that case.

II. *Dr Argyll Robertson* next exhibited TWO MINUTE TUMOURS OF THE EYE, removed two days ago from the right eye of a girl 18 years of age. They were situated over the junction of the sclerotic and cornea, towards the outer angle of the eye.

History.—They were noticed at birth, and had not shown any material increase in size during life. They were found to be very intimately connected with the structures of the cornea and sclerotic, and were somewhat difficult of removal. Their structure resembled true skin, and in the smaller of the two hairs were seen growing on the surface. They were specimens of *trichosis bulbi*, a rare form of tumour. From the same patient were removed a small fatty growth from the sclerotic, and also some pendulous growths from the auricle on the same side. This also corresponds to a case described by Dr Mackenzie, where he had a cyst only, and this was accompanied with pendulous growths from the orbit.

Dr Matthews Duncan wished to know if they developed themselves during life?

Dr Robertson said they were always congenital, not very common, and there were very few upon record.

Dr Handyside stated that it had been a very much contested point whether the cornea had a cuticle upon it or not, but he considered this pathological specimen, with hair upon it, was the best proof that could be given of hair upon the cornea.

III. *Dr Ritchie* then showed a specimen vomited by a woman, and said to be a TADPOLE! It illustrated the dangers of an impure water-supply.

IV. *Dr Stephenson* then read a paper on ELECTRO-THERAPEUTICS, which will appear in a future number of this Journal. After referring to the present position of the subject, he entered into the differences in action between the constant or Voltaic current and the induced or Faradic, as illustrated by their effects in various forms of paralysis. In some cases the muscles can be excited alike by the Faradic or Voltaic, but there are others where they do not reply to the stimulus of the first form, but readily act to that of the latter. There are also conditions of normal, increased, or diminished excitability. In the treatment of all cases a careful examination of the electric condition of the muscles is therefore necessary to determine the form of electricity to be employed. Speaking generally, that current is most useful to which the muscles preserve their contractility, but there are special indications for the selection of one or other according to the object aimed at by their use. The special superiority of the Voltaic current comes into play where we wish to act, not only on the muscles, but also upon the central lesions and secondary pareses of the nerves. The views of Remak and others on this subject were briefly adverted to.

The action of the Voltaic current, upon which the author specially dwelt in the paper, was its restorative or tonic action in impaired conditions of the nervous system and affections arising therefrom. Cases were cited from the writings of others, and the author's experience, where it had influenced the excessive secretion of urea, and relieved the exhaustion, irritability, dyspepsia, sleeplessness, vertigo, and other symptoms due to nervous exhaustion. The immediate effect in some cases was very striking, and the author believes that a wide field for its use will be opened in affections for which it has as yet been little used. The restorative action also extends to the muscles in so-called rheumatic affections (lumbago, etc.), and the back pains of females generally regarded as of pelvic origin. Cases of this class were likewise given.

Lastly, the influence of the constant current in relieving and curing pain was discussed. It is not always possible to say whether a particular case will be benefited by the current or not. If it is probable that the pain is but the enduring effect of some cause which has ceased to act, or a "habit," or produced by debility, exposure to cold, or by fatigue, a cure may certainly be looked for. But the best criterion is the effect of the remedy itself. In favourable cases an immediate relief is felt after the first application, which becomes more decided after the second or third. Much depends upon the proper mode of application; where one fails another will succeed, such as employing electro-puncture in sciatica, instead of the ordinary moist conductors. The particular point of application, the strength and duration of the current, sometimes make all the difference. Where no effect is observable in three or four sittings, it is improbable any benefit will be derived by continuing. Cases illustrative of the action on pain were reserved for a subsequent paper.

Dr Robertson remarked on the value of such a paper, and referred to the marvellous results he had seen in Remak's practice from the use of the constant current, chiefly in cases of tabes dorsalis.

Dr Wright stated that twenty years ago he had advocated the use of the constant current in diseases, and had recommended a most efficient and extremely portable form of battery. In the use of any battery it was essential to have a voltameter, but he had been disappointed in the use of the constant battery, as, though its benefits were undoubted, they were only temporary. It was of great use in rheumatism, and the most important indication was to keep up the current till a certain amount of inflammation was set up.

Prof. Sanders said that, in regard to the use of galvanic electricity, he would like that Dr Wright, who has for many years studied the subject, would communicate to the Society his views. In late years different forms of apparatus have been introduced, and particular study has been given to the effects of the different kinds of electricity, as shown by Dr Stephenson's paper. We may use electricity in various ways. It is employed either as a stimulus to excite paralyzed nerves or muscles, or it may be applied in order to give tone to the nerves and strength to the various parts stimulated. Another effect is to relieve pain; and the fourth action (one not much studied) is, where the current modifies the nutrition of the part. We are familiar with the stimulation of the electric shocks, and every one will agree they are of service. But the subjects now attracting more attention, as shown in Dr Stephenson's paper, are,—the value of electricity as a tonic, and in the relief of obscure and harassing pain. The tonic treatment, which is obtainable by the constant rather than the interrupted current, restores exhausted nervous energy, and is often of permanent benefit. With regard to pain of any kind, and especially in rheumatic and sciatic affections, we are capable of giving relief sometimes by frictional electricity, sometimes by shocks, and sometimes by the Faradic current. The effects upon wounds remain a subject of investigation. In the New Royal Infirmary we must have a room for various kinds of electrical apparatus, and we need also men specially devoting themselves to these different modes of investigation. He hoped to hear more from Drs Wright and Stephenson; and, in conclusion, expressed the pleasure with which he had listened to the paper.

Dr Stephenson then shortly replied, and thanked the Society for the manner it had received his communication.

SESSION LI.—MEETING IV.

Wednesday, 17*th January* 1872.—Dr HANDYSIDE, *President*, in the Chair.

I. *Dr Matthews Duncan* exhibited to the Society a remarkable CALCULUS which he EXTRACTED from a MALFORMED CHILD. The calculus presented nothing peculiar in itself; it was composed of phosphate of lime, and weighed 160 grains. The calculus was extracted from a cloaca, into which the rectum and bladder both opened.

II. *Dr M. Duncan* then showed a still more remarkable calculus, composed of cholesterine, weighing 390 grains; its length being 2½ inches. It was very kindly sent to Dr Matthews Duncan by Dr M'Leod of Hawick, who, at the same time, forwarded a very remarkable history, from which Dr Duncan made a few quotations. Dr M'Leod states, that he was called in to see a young lady, who had suffered from a discharge from the umbilicus, which had continued three years. On examination, he discovered a tumour, which was red, hot, swollen, and painful to the touch. She was ordered to poultice it, and in the course of four days the accompanying mass (calculus) was discharged Dr Duncan remarked, that the tumour was quite as hard when he received it from Dr M'Leod as it was when presented to the Society. In another communication to Dr Duncan, Dr M'Leod stated that there was nothing remarkable in the history of the case, except that, in the progress of the calculus to the surface, no symptoms of disturbance were observed, save several severe exacerbations, which took place three years ago. Before the discharge commenced, there appeared to be no suffering worth mentioning. The calculus came right through the navel, which very speedily contracted, and is now completely closed. Professor Crum Brown kindly analyzed the specimen, so that there could be no doubt it was composed entirely of cholesterine.

III. *Mr Annandale* next presented to the Society a few specimens of morbid growths. The first, Mr Annandale stated, was a good example of a tumour growing from the bones of the forearm. The tumour itself was cartilaginous in nature, but the principal point to be observed was the rapidity of its growth, which was only four, or not exceeding five, months. Another interesting point connected with the tumour consisted in the fact, that this same patient had the ring finger removed several years ago, for a tumour of the same kind. The patient was an old woman, seventy-three years of age. According to her statement, there was nothing in the history which could account for it spreading up her arm. The operation was performed by Mr Annandale three weeks ago, and now patient was quite recovered, going about the ward.

The second specimen Mr Annandale presented to the Society, was a good illustration of one of those cystic tumours not uncommonly met with in the neck.

History.—The cystic tumour had existed for twenty-five years in the neck of this woman. Latterly, the cyst had become very troublesome. For one or two years previous to operation, a discharge was constantly trickling away, and should the opening in any way become closed, the cyst required to be opened twice a week, from the accumulation of fluid which took place. The operation was quite simple, except that in the deeper dissections very great care was required to separate the tumour from its deeper connexions, as it was at its posterior aspect firmly adherent to the carotid artery and the internal jugular vein. Mr Annandale applied a ligature round a small portion of the tumour, but the greater part of it he cut away with the knife.

IV. *Mr Annandale* next exhibited the HEADS OF TWO FEMURS, which he had removed quite recently. The patients in both these cases were doing well.

V. *Dr Fergus*, of Glasgow, then read a paper on "The Sanitary Aspect of the Sewage Question, with Remarks on a little-noticed Cause of Typhoid and other Zymotics." This paper was published in the February number of this Journal, at p. 717.

Dr Matthews Duncan said that the importance of the question of maintaining health and saving life would be admitted on all hands. Attention had been directed by the lecturer to effluvia from drains and sewers, but there was another source of bad smells—the adhesion of soap to the waste-pipe of an ordinary washhand-basin. He mentioned a case in point which had come under his own observation, and said that the defect had been cured by the introduction of a trap. He pointed to the great evils which resulted from imperfect fittings, and concluded by taking exception to the list of zymotic diseases read by Dr Fergus, and which were said to result from sewer-gases.

Bailie Cousin observed that, as an outsider, he might advert to one point which had not been touched upon by Dr Fergus, viz., the escape of water from corroded pipes to the cisterns beneath. In common stairs it was quite a usual thing to have the closets one above the other, and a water-cistern above each. When corrosion took place, the water percolated into the cistern beneath, and this was no doubt the cause of much disease. Speaking in reference to Hoey's patent, he gave it as his opinion, that it would be a dangerous thing to introduce such a small quantity of water, even with the use of sulphuric acid.

Dr Littlejohn said he could corroborate what Bailie Cousin had said in reference to water passing from closets into cisterns beneath. He had listened with pleasure to the expedients to which Dr Fergus had referred to supersede water-closets; but the difficulty he had was, that while such expedients might be carried out successfully in a gentleman's house, the case was different when the application was made to populous tenements. What he desiderated was, some plan whereby sewage might be conveyed from large tenements without creating a nuisance. He said that Ramage's patent worked well and easily in the water-closet; but unless proper arrangements were made, no system on earth would give satisfaction. Unless plumbers were looked after, the pipes and traps, instead of being operative, would in many cases be inoperative. The back pipes must also be ventilated not only *qua* the house, but *qua* the house in which the pipes were placed. Having mentioned that it would be necessary to cleanse the closets at least twice a year, he went on to say, that so far as his experience went, there was a forcible connexion between certain diseases and sewage. Of late, the Town Council of Edinburgh had insisted upon water-closets being introduced into working men's houses. Now, he found that if they took a range of houses where this had been done, in the course of one year there were double the deaths from typhoid and scarlet fever, and any epidemic fever occurring in these houses was intensified, and assumed a character of malignant mortality.

Dr Fergus briefly replied; and a vote of thanks having been accorded to him from the chair, the public business terminated.

OBSTETRICAL SOCIETY OF EDINBURGH.

SESSION XXXI.—MEETING IX.

27*th March* 1872.—Dr Pattison in the Chair.

Prof. Schroeder, Erlangen, was admitted as an Honorary Fellow of the Society; and Dr Borwick Robertson, Lauder, was admitted as an Ordinary Fellow.

I. A NEW MODE OF TREATING PUERPERAL FEVER.

BY DR CHARLES BELL.

It is not my intention to enter on a lengthened dissertation on puerperal fever, as it is fully described in many of our works on midwifery, and my object is merely to bring more prominently under the notice of the Society a mode of treatment which I have been induced to recommend, from its successful results in diseases of a similar nature, as well as in the few cases of this disease in which I have had the opportunity of employing it. For, although I have been connected with the Royal Maternity Hospital for many years, only one case of puerperal fever has occurred during the period I was doing duty. I ascribe this immunity from the disease, to the liberal use of the permanganate of potash, both as a lotion and in the form of liniment, in making examination per vaginam, and to a strict attention to ventilation, and to the avoidance of overcrowding the wards. I feel satisfied that there is greater risk to the parturient woman, from a close contaminated atmosphere, than from the free admission of pure air into the lying-in chamber. I have therefore always ordered one of the windows of the wards to be kept partially open.

The more we study puerperal fever, the correctness of the opinion entertained by Sennertus and Riverius will appear the more obvious, namely, that it is a blood disease arising from the absorption of a virulent poison into the system, which is communicable from one individual to another, and may also be inhaled from the atmosphere. This circumstance was fully illustrated by M. Peu, in his description of the epidemic fever which appeared in the Hôtel Dieu in 1664, when a great number of women died, in consequence of the number of wounded persons who were accommodated under the lying-in ward. This was the first appearance of the disease in the epidemic form, and it was peculiar in its character, as it was preceded by hæmorrhage, and was attended by numerous internal abscesses. It formed a striking contrast to the next epidemic, which occurred in Paris in 1746, and proved fatal to many women both in the hospital and to those who were delivered in their own houses. According to Montonu, it "commenced with diarrhœa; the uterus became dry, hard, and painful; it was swollen, and the lochia had not their ordinary course; the women experienced pain in the bowels, particularly in the situation of the broad ligaments; the abdomen was tense; and these symptoms were sometimes joined with pain in the head and cough. On the third and fourth day after delivery, the mammæ became flaccid. On opening the bodies, matter like curdled milk was found on the surface of the intestines; a milky serous fluid in the hypogastrium; a similar fluid was found in the thorax of certain women; and when the lungs were divided they discharged a milky putrid lymph. The stomach, intestines, and uterus, appear to have been inflamed.

It may not be uninteresting to refer to the character of the disease as it appeared in the epidemic which occurred in Paris and Lyons in 1750, as illustrating still further the complications which attend the disease, and prove still more its zymotic character. Poteau informs us that the uterus was found enlarged, and its internal surface soft and black, and its parietes were livid and gangrenous.

While puerperal fever may be complicated in the manner just described, it is not a necessary consequence, as, like smallpox in its most fatal form, it runs its course so rapidly in some cases that there is no time to form any local lesion which can be ascertained during life, or discovered after death. Dr Rigby informs us, that in some of the cases which came under his notice in the general lying-in hospital, there was "neither time nor power sufficient to produce either symptom or trace of inflammation, the powers of life having from the commencement sunk under the deadly influence of the disease." He therefore adds, "that of all the diseases to which the lying-in woman is exposed, puerperal fever is the most to be dreaded, and that there is none in which the accoucheur is frequently more helpless."

In a disease of such virulence, it is of the utmost importance that a remedy should be discovered to moderate its severity. I am convinced of its similarity to erysipelas—a circumstance which has been proved, not only by its appearing epidemically along with that disease, as happened in Barnsley in 1808, and in Leeds in 1809, but there are instances on record,[1] in which puerperal fever has been induced by those attending patients suffering from erysipelas, and then attending women in their confinement; and there have also been instances of puerperal-fever patients producing erysipelas in their nurses. I have also observed both diseases existing at the same time in the same individual. I was therefore induced, many years ago, to suggest that the treatment which I had found so beneficial in erysipelas should be adopted in puerperal fever. I had no opportunity, however, of putting it in practice until a comparatively recent period, when I employed it in the only case which came under my care in the Maternity Hospital, and although the case was very severe, and the patient's life was despaired of, it proved successful, and the woman left the hospital in health. I have already reported this case to the Society. The success which attended this case led me to adopt it in another case, which I was requested to see by Professor Simpson, which was considered hopeless, yet the patient left the hospital in perfect health. Through the kindness of Dr Young, I had an opportunity of employing the treatment in a patient of his, whom I attended in a premature labour. She was seized with puerperal fever soon after her confinement, and I despaired of her recovery, but she was ultimately restored to health, I understand, for I ceased my attendance before she was quite recovered.

The treatment of puerperal fever in former days was of the heroic kind, as the following case illustrated, and I relate it in order to show the contrast to what I recommend.

22*d Nov.*—Mrs S., aged thirty-four, a thin delicate-looking woman, with a sallow complexion, was delivered of her third child, a girl, after natural and apparently easy labour. The placenta was expelled immediately after the child. The womb continued large, although there was no hæmorrhage.

24*th Nov.*—Apparently going on satisfactorily, and she felt so well that she sat up in bed for some time in the morning, but at 1 P.M. she was seized with rigors, followed by a glow of heat, soon after which violent pain in the region of the uterus, which was still large.

A linseed poultice was applied to the abdomen, and she had the following powder: calomel gr.ii., and antimonial powder gr.v., in gruel.

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[1] Ramsbotham, p. 596.

8 P.M.—Bowels moved twice; pain in the womb so severe that she could not bear the slightest pressure; pulse 120, full and strong; tongue white and flabby. She was bled to ℥xvi., when she became sick, and vomited some undigested food. The stomach was so irritable that she got no medicine.

25*th Nov.*, 8 A.M.—Has had some sleep, but is still in great pain in the lower part of the abdomen; pulse 120, weak. To have two dozen of leeches, and then the following powder:—℞ Hydrarg. cum creta, gr.iv.; pul. Doveri, gr.x.

2 P.M.—Dr Rigby ordered the womb to be washed out with tepid water, and that she should have six grains of calomel and four of antimonial powder.

11 P.M.—Has had several hours' sleep, and feels easier, although there is still much tenderness on pressure; pulse 120, full. To have the white saline mixture in the morning, until the bowels are moved.

26*th Nov.*—Has perspired freely during the night. Bowels moved several times. Stools dark-coloured at first, but they became more natural. The uterus more painful and swollen, and there is slight tympanitis. Great thirst; tongue furred. Pulse 128, sharp and resisting.

Eighteen leeches were applied to the abdomen, and she had eight grains of calomel and four of antimonial powder. A linseed poultice to be continued after the leeches come off.

9 P.M.—Feels easier, and there is less tenderness on pressure. Tongue cleaning round the edge; pulse 132, weak. Bowels moved several times. The womb to be again washed out with tepid water.

27*th Nov.*, 8 A.M.—Complaining of general soreness, but has no pain on pressure, although the womb is large and hard. Bowels moved several times; tongue cleaner. Expression of countenance very anxious. To have the following draught:—℞ Mist. cretæ, ℥ss.; tinct. catechu, ʒj. M. Ft. haustus.

This draught to be repeated after every stool.

2.30 P.M.—Dr Rigby ordered her to have a soda powder.

4 P.M.—Dr Lee saw her, and ordered her to have three grains of gray powder, with four of Dover's powder, every four hours, in consequence of her having vomited a quantity of bilious matter.

8 P.M.—Bowels moved twice, and she has again vomited a quantity of bilious matter, and she feels much exhausted; eyes sunk; countenance extremely anxious; tongue loaded with white fur; pulse 130, weak. To have two grains of opium.

10.30 P.M.—No return of vomiting and purging, and feels easier than she has done since her illness. The uterus seems less, and is free from pain; but the abdomen more tympanitic. It was rubbed with lard and a poultice applied, with great comfort. The first joint of her middle finger much swollen and inflamed, and the pain extends to the shoulder. To have laudanum applied.

28th Nov., morning visit.—States that she is quite comfortable, although very weak, and has much pain in the right arm, which is inflamed from the wrist to the elbow on the outside, and there are several dark spots on it.

To have a lotion, composed of equal parts of camphorated spirit and ammonia, applied to it, and to take one of the following pills every hour:—℞ Camphor, ext. hyoscyam., āā gr.viij.; opii, gr.iii. M. et divide in pil. iv. To have sago and wine.

She sank rapidly, and died at 2 P.M.

In place of such active treatment as was adopted in the above case, I recommend small doses of calomel and James's powder in proportion of a twelfth of a grain each, along with a grain of white sugar, carefully mixed and given regularly every two hours until the bowels are freely moved; and thirty drops of the muriated tincture of iron every three hours. The vagina to be washed out several times a day with Condy's red fluid and tepid water, and a linseed poultice applied to the abdomen. If this treatment is regularly and fully carried out, and not in the *timid, partial* way which many practitioners do in erysipelas, and then undervalue the treatment, I feel certain it will give the best chance of cure to the patients.

Dr James Young believed that great benefit was obtained from using calomel in the manner described by Dr Bell; he had lately suffered from an attack of erysipelas, and been treated with the tincture of the muriate of iron and calomel, in doses of a twelfth of a grain, with the best results. He had never seen head symptoms in puerperal fever, and he looked upon diarrhœa as one of the most serious complications you could have in that disease.

Dr Ritchie had tried calomel as a purgative, in the Children's Hospital, in doses of a twelfth of a grain, but without any effect. He considered it important to distinguish the special character of the fever; in a fever of the typhoid type he would not be inclined to use the tincture of the muriate of iron.

Dr Bell regarded puerperal fever as a disease *sui generis*, and that you may have complications occurring in it as in any other disease. The tincture of the muriate of iron he believed lowered both the pulse and the temperature. The efficacy of the powder depends greatly on the manner in which it is compounded, and the regularity with which it is given. When these have been properly attended to, he has never found it fail to move the bowels, and to diminish fever; but if they are neglected it is not surprising that it should cause disappointment.

II. CASE OF ACUTE INVERSION OF THE UTERUS. BY DR KIRK DUNCANSON.

Mrs B., primipara, aged 23, of nervo-sanguineous temperament, was seized with spurious labour-pains on the morning of Wednesday. These pains continued more or less up to Friday night, when, as there was no dilatation of the os, a strong dose of bromide of potassium with chloral hydrat was given; to be repeated in two hours. The patient did not sleep, but the lips of the os uteri could be easily dilated to the size of half-a-crown on the Saturday morning. The waters had been dribbling away, during the intervals from pain, through the night. The head was felt presenting in the first position of Naegele high up at the brim of the pelvis. The passages were moist, cool, and roomy. The patient preferred moving about the room to lying in bed. At six o'clock in the evening, the patient, owing to her restlessness during the pains, was given chloroform. She was as restless without the anæsthetic as with it, unless when given in enormous quantities, producing profound anæsthesia and cessation of the pains. At five minutes to twelve o'clock, by inserting the fingers of the left hand into the rectum the head was tilted out of the external outlet. The cord was felt round the neck, but was relieved as the head escaped. As the shoulders and body were passing through the outlet, the patient, who was with difficulty kept in the recumbent lateral posture, suddenly flung herself round upon her abdomen, at the same time throwing her arms round an extra attendant at the other side of the bed. Immediately after the birth of the child the patient made a strong expulsive effort as if bearing down during a pain. The child was asphyxiated; the face and head livid. Restorative means were used, and the pulsations in the cord were feeble before ligatures were applied, and the child, a boy, separated. In the meantime the mother was lying upon the extra attendant, perfectly conscious; asked if the child was a boy or a girl, etc. After handing the child to the nurse, on going round to the left side of the bed, the patient's pulse was felt to be good. She felt perfectly well. She was assisted round upon her left side, and back to the other side of the bed, her head being kept as low as possible. On feeling the cord close to the vulvæ the bifurcation of the vessels was felt. The placenta was supposed to be lying in the vagina. To see that the uterus was properly contracted whilst the placenta was being removed with the right hand, the left was placed on the abdomen where the uterus is generally felt like a fœtal head. The appearance of the fœtal head was not felt, but a depression with two lateral prominences. In the meantime the placenta had been easily withdrawn with the right hand, and disposed of; the fingers were inserted into the vagina to feel for and remove clots, when immediately within the vulvæ, a large, firm, round body was felt. The absence of the uterus from its usual place, and this strange body in the vagina, was very like inversion of the uterus, but there was no collapse, and the hæmorrhage, if any, was very slight. The complete inversion of the uterus, on further examination, could not be mistaken; the large globular mass pretty firm, and the cervix distinctly felt, but the fingers could in no direction upwards escape from the vagina. The patient had a glass of whisky given her. The relatives were informed that there was something unusual—something I had never seen before; and although the patient looked quite well at present, the sooner Dr Keiller was sent for the better. Dr Keiller was immediately sent for. My anxiety led me to attempt the reduction of the inverted uterus. Placing the patient upon her back, I pressed upon the fundus, with the points together of the fingers of my right hand. The patient, screaming, withdrew herself; so the attempt to push up the fundus in this way was given up. On the patient's looking drowsy, and the hæmorrhage increasing, another attempt at reduction was made. The patient was again at the left side of the bed. This time the left hand, with the back of hand and arm well larded, seized the inverted uterus within the vagina, as one would seize the bag of Lister's carbolic spray-producer with the left hand, then gradually pressing upwards as a whole, and compressing the fundus most firmly with the little finger and the third finger. When the vagina was enormously stretched upwards the fundus was felt gently yielding; the thumb was pressed against it; the other pressure being still kept up, the uterus replaced itself suddenly. The uterus felt softer, and was more covered with clots when the second attempt was made than it did at the first. The cervix was also more relaxed, and the patient's struggles and attempts at withdrawal were more feeble than when the right hand was inserted as a cone. Feeling the uterus returned to its normal position, I withdrew my left hand, and, Dr Keiller arriving just then, the clots, which were felt like cords hanging from the uterine sinuses, were left. Dr Keiller, who was very soon in the house after receiving the message, on examining the patient, found the fundus still a little depressed. I had not followed it up with my fingers. Dr Keiller speedily put the uterus all right, and it could soon be felt like a fœtal head in its proper place. Collapse was now complete. Stimulants were given, hot bottles were applied to the feet and legs, etc. The patient remained in this state for two hours. She was able to swallow. About three o'clock in the morning she began to stare wildly round her, ask for her baby, where had she been, etc. She was told to be very quiet, and was given some ergot with brandy. Shortly after this, violent retching and vomiting set in; nothing would remain, not even brandy, on her stomach. All the vomited matter smelt strongly of chloroform. After the vomiting had ceased for some time, now about five o'clock in the morning, the patient took a small piece of water-biscuit made as breadberry, with brandy; shortly after this she took a drink of ginger-beer, with a small piece of plain water-biscuit. From five to seven she had short intervals of sleep, taking some nourishment when she awoke. I left her about half-past seven, but had not been long home when I was suddenly recalled by a message stating that the patient was worse than she had ever been. On reaching the patient I found her no worse than when I left her, but still restless. She got one grain of opium, and was told to lie quiet and sleep. Her pulse then was 108 beats per minute. She was seen frequently during the day. Her pulse improved in strength, and rose to 120 beats per minute at night. The pulse was 120 on the Monday morning, and rose to 130 in the evening. Tuesday morning it was 120, and the temperature 101° F.; the evening temperature rose to 103° F., with a pulse of 130. On the Wednesday morning the temperature was 101°; pulse 120. The temperature and pulse gradually fell to the normal after this. She had her bed changed on the Tuesday, and was able to be out of bed on the Tuesday following, ten days after delivery.

The causes of the inversion in this case may have been,—1*st*, The uncontrollable restlessness of the patient; 2*d*, The saturation with chloroform of the patient's system—she had fully three and a half ounces in less than six hours. (1.) The restlessness of the patient caused her to walk about the room when there was no need for it; and loss of sleep on the Wednesday and Thursday nights. (2.) The chloroform saturated the patient's system, and destroyed the tonicity of the uterus. These may be the predisposing causes. The immediate causes may either be the patient's striking her abdomen, and thus the fundus of the uterus, upon the attendant or bed; or the shortness of the cord, and its dragging round the neck of fœtus. (The cord was not more than 14 inches in length.) Either of these separately, or both combined, may have caused a depression of the fundus. This depression of the fundus caused the patient to use the strong expulsive effort which occurred immediately after the birth of the child, and made a complete inversion of the uterus. The inversion was acute, as the reduction was completed in less than one hour after it was diagnosed; and in less than an hour and a half from the birth of the child, or the occurrence of the inversion of the uterus, it was returned to its proper situation.

Part Fourth.

PERISCOPE.

Removal of Corns.—Hard corns may be carefully picked out by the aid of a small sharp-pointed scalpel or tenotomy knife, and if well done the cure is often radical, always perfect for the time. But they may be equally successfully removed by wearing over them for a few days a small plaster made by melting a piece of stick diachylon (emplastrum plumbi), and dropping it on a piece of white silk. The corn gradually loosens from the subjacent healthy skin, and can be readily pulled or picked out. Soft corns require the use of astringents, such as alum dissolved in white of egg, or the careful application of tincture of iodine. Prevention, however, is in regard to them better than cure, and can be readily attained by daily friction with cold water between the toes.

ON THE TREATMENT OF HYPERPYREXIA BY THE EXTERNAL APPLICATION OF COLD.—In a very interesting and exhaustive paper upon this subject, Dr Straus of Strasbourg goes over the entire history of the treatment of hyperpyrexia by the external application of cold, from the time of Hippocrates down to the present day, and the conclusions he arrives at are as follow:—If a healthy man be placed in a cold bath he speedily becomes chilled; his skin pale, *cutis anserina;* he shivers, and the thermometer in the axilla falls in proportion to the coldness of the water employed; but if the temperature of the interior of the body be taken in the anus, this is found to be normal, or only to fall a few tenths of a degree, and it only falls in any important degree when the experiment has been pushed to an extent which dare not be approached in therapeutics; but then the innervation of the heart and lungs becomes seriously implicated, and the bath cannot be prolonged without compromising life itself. A sound man therefore, plunged into cold water, maintains the mean normal temperature of his blood notwithstanding the increased abstraction of heat from his surface, and he does so by an increased production of heat, which persists for a time, and is revealed when he is removed from the bath, dried, and clothed, by the production of that transitory febrile state termed the reaction, which is accompanied by a cutaneous temperature above the normal. Similar results occur in pathological conditions: a fever patient does not merely retain more heat than a healthy man, he produces it; instead of 37° C., his normal temperature is 39° C. or higher, and if he be plunged into a cold bath the results are similar. The cutaneous temperature is speedily brought down to that of the bath; the anal temperature falls only in a relatively insignificant amount, never more than one degree; and when removed from the bath the reaction occurs as in the physiological condition, so that at the end of two or three hours at the most, the initial temperature is attained or even surpassed. Even supposing, then, that this trifling and temporary lowering of the temperature, of a maximum of one degree, and lasting at the longest for two or three hours, should be considered desirable of attainment, it would be necessary to give the patient from ten to fifteen baths in the twenty-four hours, involving a most laborious practice for the attainment of a most trifling result.

There is one point, however, remarks Straus, upon which all the partisans of cold are agreed, and that is the sedative influence which the cold bath exercises upon the affections of the nervous system, and that this use of cold is most efficacious in delirium, cerebral affections, cephalalgia, singing in the ears, etc., and that it has thus a most favourable action in the malignant forms of fever, especially in the ataxic and adynamic forms. But, adds Straus, similar results have been obtained with much more certainty and energy by Currie's old method of cold affusion, which is more especially of the greatest value, and is specially indicated in an accident of extreme gravity which occasionally occurs in fevers—collapse.

It sometimes happens during the course of a fever that, when the thermometric ascension has reached its height, the temperature taken externally experiences a sudden fall from 40° or 41° to 34° or 32° C., while the anal temperature still maintains its former height. The skin is at the same time covered with a cold and clammy sweat, the heart contracts feebly, and the pulse becomes extremely feeble and thready. Such is the condition to which Wunderlich and his disciples have given the name of collapse.

The skin is chilled because the heart no longer has the force necessary to impel the circulation through it, the heart is paralyzed, and the lungs also, as seen in the short, superficial, often unequal and intermittent respirations, and revealed on auscultation by the gradually-increasing engorgement of the lungs and the accumulation of the bronchial secretions, which the patient has no longer power to expel, exactly as happens after section of the pneumogastric nerves. And this collapse no doubt does arise from paralysis of these nerves, or rather of those nervous centres which preside over the functions of respiration and the production of heat, and it is these centres which it is so important to rouse by reflex excitement. The readiest method of doing this is the cold douche: a waterproof sheet is slipped under the patient, his shirt is removed, and he himself raised to the sitting posture, and a pitcherful of water, at a temperature at or a little above 10° C. (50° F.), is then poured over his head from a height of from one foot and a half to three feet. The result is marvellous, and is one often, nay, almost daily, observed in the clinique of Professor Hirtz. The patient, plunged in stupor, is suddenly roused by the shock; he draws a long breath; the respiration becomes fuller, freer, and more regular; the cardiac ataxy ceases, and the pulse becomes fuller and stronger; traced by the sphygmograph during the collapse, it presented a horizontal line, hardly broken by a few feeble undulations; during the affusion the line of ascension is reproduced and becomes well marked, showing increase of cardiac force, and also of arterial tension. The affusions should be repeated during two or three minutes; when finished, the patient is dried, laid down and covered up, the waterproof being removed. The thermometer, now applied in the axilla, shows that the external chilliness has disappeared, and that the temperature there is now normal or even higher, the anal temperature being considerably reduced. The temperature has, in fact, been redistributed, and the equilibrium between the external and internal temperature restored, the rupture of which is in a measure characteristic of the condition of collapse. The lungs, too, are now found to be acting freely, the râles are diminished, and the passing congestion is disappearing.

It is easy, however, adds Straus, to understand the physiological action of this mode of treatment; cold employed in the form of affusion—that is, quickly and temporarily—acts not by subtracting heat, for the amount actually removed is perfectly insignificant, but by exciting, by its powerful and energetic reflex action, the nervous centres which preside over and regulate the circulation and production of heat. While acknowledging, therefore, the utility of Currie's cold affusions in febrile nervous affections, delirium, ataxy, and even in collapse, and also the advantage and propriety of cold sponging in refreshing the patient, and in cleaning and exciting the skin, Straus regards the use of the cold bath in the treatment of fever as a most expensive, troublesome, and possibly dangerous mode of producing very trifling results, and as far inferior to the use of such antipyretic remedies as quinine and digitalis, adding that a single draught of one gramme (15 grs.) of digitalis would lessen the fever more than a whole series of cold baths.—*Bullétin Général de Thérapeutique Médicale et Chirurgicale,* March 1872.

Coexistence of Smallpox and Cowpox.—Recently a Mr Furley has been announcing in the public prints that to cure smallpox it is sufficient to vaccinate the patient, the mere entrance of the vaccine lymph into the system, according to him, sufficing to annihilate the variola. In this he has been anticipated by a Dr Tynedale of New York, who, in the New York *Medical Record* of 1st March 1872, made a similar statement. Dr T. has recorded several (nine) cases in which vaccination during the primary fever sufficed, according to him, to cut short the variola. All of these cases had, we believe, been vaccinated previously at some anterior period of their lives; and when we reflect how variable the effect of the variolous poison is, even upon those unvaccinated—Sydenham himself stating that sometimes it produces a variolous fever alone, at others a fever with an erythematous blush, and at still other times a fever, a blush, and a papular or pustular eruption of varying intensity—when we further reflect on the undoubted prophylaxis which a previous vaccination exercises over a subsequent attack of smallpox, reducing the mortality from 50 to 2 or 3 per cent., and modifying the course of the disease in an indefinite manner, sometimes preventing it passing beyond the stage of mere fever, and at others drying it suddenly up when it has already reached the pustular stage,—we think the effect of vaccination in cutting short a variola already commenced will be more properly referred to the still-abiding influence of a previous vaccination, or to the coexistence of some of those unknown constitutional conditions which occasionally sufficed to modify variola when vaccination was still unknown. And this idea is confirmed, when we find that one of the most accurate of observers and most painstaking inquirers, Sir James Simpson, found that variola and vaccinia might exist simultaneously without the one modifying the other; that death from variola might even occur while the vaccine eruption was fully developed; and that, in order that the one should modify the other, its eruption must have the start of the other by at least three or more days.—Vide *Ed. Med. Jour.*, Sept. 1854, p. 276.

Xylol in Smallpox.—This new hydro-carbon ($C_8 H_{10}$) was first separated from coal-naphtha by Dr Hugo Müller, and has been recently introduced as a remedy for smallpox by Dr Zülzer, of La Charité, Berlin. It has been given in capsules containing 3 to 5 drops for children, and 10 to 15 for adults; and, according to him, was employed with "complete success." More recently, Dr Burkart of Stuttgart has stated the following conclusions to be those he has arrived at in regard to its use:—1. In varioloid and simple variola xylol is superfluous; there is no remedy which can hasten the eruption, or shorten the course of this disease. 2. In confluent variola, xylol has no influence any more than other antipyretics. Death in such cases occurs from interference with the functions of the skin, just as in extensive burns, and xylol is no specific for this. On the other hand, xylol has an undoubted influence on the angina and eruption in the throat, and enables the patient to continue to take nourishment freely to the last, being far superior in this respect to any other kind of gargle or spray. It is also a most efficient deodorizer, and therefore presumably a disinfectant. 3. In septic variola a few isolated cases recover even without treatment. In the severe forms treatment is of no avail.—*Berliner Klin. Wochenschrift*, No. 18, April 1872.

[These results exactly coincide with those obtained in the treatment of variola in the Edinburgh Infirmary. To obtain this good result, the xylol must be given in a mixture, and sprayed over the throat and surface of the body; capsules are useless, and often excite vomiting. Probably xylol may prove also serviceable in the angina of diphtheria, enabling the patient to take nourishment, while in that disease also its efficiency as a deodorizer cannot but be useful. —Ed. *E. M. J.*]

A Novel Plan for Soothing Children.—Dr Cowran says, in his *Medical History of the Himalayas*, speaking of a native tribe in the northern district of the peninsula:—

"The women are larger and fairer than their sisters of the plains; and they have a curious plan of quieting their children while absent from them in the fields or elsewhere, which is as simple as it is efficacious, and which baby-farmers and others might imitate with advantage nearer home. When a mother goes into a field to work or is otherwise unable to take her child with her, she selects some sheltered spot near a stream, in which she places a little straw for a bed for her infant, and then directs, by means of a piece of split bamboo, a current of water, of from one to two or three inches in diameter, on its uncovered occiput and temples. This produces a soporific effect, which generally lasts as long as the water continues to flow. The sleep is said to be very soothing, and children who have been much subjected to its influence are known to have been unusually free from the annoyances incidental to the period of dentition. I came upon a mother thus engaged, on my way to Cashmere, in the hot season of 1867, and she was so entirely absorbed in her occupation as to be, for some time, quite unconscious of my presence. During this interval I noticed that, while holding the child with one hand and dabbling water on its head with the other, she now and again rocked it to and fro, and sang at the same time, in a soft plaintive voice, an air which reminded me of the old nursery rhyme, 'Shoho, lullaby, go to sleep baby,' and recalled to my memory with tenfold force the saying of the great dramatist, 'One touch of nature makes the whole world kin.' As soon, however, as she noticed me, she snatched up her infant, and skuttled away down the ravine with a rapidity of force, which every moment threatened both with destruction."

Part Fifth.

MEDICAL NEWS.

Dr J. Bell Pettigrew, F.R.S., is at present engaged in delivering a weekly series of lectures on "The Physiology of the Circulation in Plants, in the Lower Animals, and in Man," before the Royal College of Surgeons, Edinburgh. Dr Pettigrew has already acquired a very considerable reputation by his anatomico-physiological publications, particularly those on the "Arrangement of the Muscular Fibres of the Vertebrate Heart," on the "Relations, Structure, and Function of the Valves of the Vascular System in the Vertebrata," and on the "Physiology of Wings,"—all of which exhibit in a very marked manner that originality of mind which leads him to place the most commonplace phenomena in a novel light, as well as that depth of philosophic comprehensiveness and steadiness of purpose which permit no vague speculation, but compel him to unravel step by step the most complicated anatomical structures or physiological acts, till they are exhibited in all the clearness, simplicity, and accuracy of an algebraic equation. The present series of lectures, judging from the two that have already been delivered, are characterized by similar qualities, and will certainly contribute to establish his fame as "the most distinguished pupil of Goodsir."

We have much pleasure in informing our readers that the publication of these lectures will be commenced in our next number, and will be continued throughout the year.

SANITARY DEPARTMENT, GLASGOW.—We regret, for the sake of Glasgow, to learn that it is likely to lose the able services of Professor Gairdner, ostensibly for the sake of a paltry saving of £100 a year. The whole of the inquiry connected with this movement has been conducted without any communication with Dr Gairdner himself. At this he not unnaturally feels hurt, and has addressed a most temperate letter to the Lord Provost, which we regret being unable to find room for. So far as Dr Gairdner himself was concerned, the time devoted to sanitary affairs was simply thrown away, the paltry salary which he received being no more than a mere nominal acknowledgment of his services. For Glasgow, however, the services of so well-known and so experienced a sanitarian as Dr Gairdner were simply invaluable. The enormous amount of money thrown away in the necessary expenditure connected with preventible disease, and the pauperism thereby produced, is almost incalculable, though now and then we get partial glimpses of the truth, which are sufficiently startling. It is mainly to the inquiries of men like Dr Gairdner that the profession look for trustworthy data to determine the exact amount of this waste of money and of lives, and also to point out the best mode of saving both; and, for humanity's sake, we regret his loss of a position which was only valuable to himself for the scope it gave to the exercise of his philanthropy.

OBITUARY.—The late THOS. BARNES, M.D., F.R.S.E., of Bunker's Hill, was born in 1793, at Dockray Rigg House, near Wigton, and died in the 79th year of his age, at Bunker's Hill, on Sunday last, the 31st ult. Having chosen medicine as his profession, he became an apprentice of the late Dr Joshua Rigg of Wigton, at that time the only medical practitioner in the district. The office of a doctor's apprentice was no sinecure in those days, commencing his work at six in the morning and continuing uninterruptedly until ten at night, and often later. There were then neither druggists, veterinary surgeons, nor dentists in Wigton, and the doctor's apprentice was expected to take the place of all three,—to prepare and dispense medicine for men, women, and children, horses, cows, and dogs, to extract teeth, to supply coffee and pepper; and, in addition, he had to look after the doctor's horses and keep his books. After the usual term of apprenticeship, he went to Edinburgh in 1811, and entered as a student of medicine at the University. In 1815, he became a member of the Royal College of Surgeons in London, and then studied for some months on the Continent, visiting the chief hospitals both in France and Germany, and attending several classes of the Paris Faculty of Medicine. It may here be mentioned, that he was present at the battle of Waterloo, and he used to relate many curious incidents in his adventures of that period, having had all his luggage and money stolen, and being left penniless and friendless in Brussels. On returning to this country he proceeded to Edinburgh, and after spending the winter 1816–17 attending the medical classes and doing hospital work, he took the degree of Doctor of Medicine at the University in August of the latter year. Whilst looking about him, a vacancy for a physician occurred in Carlisle, and his friends putting a strong pressure upon him, he came and settled here shortly after his graduation. He was at once appointed Physician to the Dispensary. Confining himself solely to the practice of medicine and to consultation practice, his progress was not rapid, but was sure. As a consulting physician, five-and-twenty years ago, there was no one to equal him in the northern counties. He was ceaselessly active, constantly on the move, an accomplished horseman, and fond of riding. The writer has heard him relate of his riding more than sixty miles a day, and how, on one morning, he rode from Carlisle to Keswick, and surprised the surgeon whom he had to meet in consultation at his breakfast. Ever anxious for the advancement of medical science, he was not backward in giving the results of his own observation, and contributed many valuable articles to the medical and scientific journals. It would be out of place here to give more than the titles of his medical writings, of which perhaps the best known were the following:—His graduation thesis, "On Erysipelas" (in Latin), published in 1817. His essay on "Abscess of the Lungs," read before the British Association, at Newcastle, in 1838. His "Biography of Dr Jackson, Inspector of Military Hospitals," published in the third volume of Transactions of the Provincial Medical Association; his papers on "Fever," "Variola," "Varicella," "Vaccination," "Hernia," in the *Edinburgh Medical Journal;* "On a Knife-Eater," in the *London Med. Phys. Journal.* He also published many papers of general and scientific interest. The "Topography of Cumberland and Dumfriesshire," in the *English Cyclopædia*, was from his pen. His paper "On the Meteorology of Carlisle for Twenty-four Years," was read before the Royal Society of Edinburgh in 1827, and procured for him the much-prized title F.R.S.E. He was elected in the same year as the late Professor Syme, and at the time of his death was one of the oldest Fellows.—*Carlisle Patriot*, April 5.

DR JAMES LUNDIN BROWN, who died at Malvern on the 2d May, was a graduate of the University of Edinburgh. After leaving college he carried on his medical education at the Edinburgh Infirmary, at St Bartholomew's Hospital, in the Hospitals of Paris, and, lastly, in Dublin. He entered the army in 1854, on the outbreak of the Russian war, and, as assistant-surgeon in the Rifle Brigade, 2d Battalion, went through the Crimean campaign. To the practical experience gained in that war he doubtless owed much of his surgical skill, while the hardships he underwent would largely aid in imparting to him that knowledge of men, and that genial sympathy with them, which formed so beautiful a feature of his professional life. After the Crimea, not liking the inactivity of Aldershot, he left the army, and took a country practice at Rickmansworth, Herts, where he remained five years. He then spent two years in travel and study, visiting Florence and Rome, and devoting himself mainly to art, the classics, and Dante. After this he settled down to practice at Malvern Wells, where he married in 1871; but, before the close of the year, he had the great misfortune to lose both his wife in childbirth and his child. After this sad event, he never applied himself again to the duties of his profession, and died, as has been said, early last month.

It is to be regretted that Dr Lundin Brown never published anything, as, from the stores of knowledge he had accumulated, his unusual powers of thought and of expression, and the fragments he has left, he could undoubtedly have contributed usefully to general literature; while, from his devotion to his profession, especially in certain departments, such as gunshot-wounds and diseases of the eye, he was possibly in a position to make valuable additions to medical science. He was a great student of theology, a science of which he was particularly fond. He was also a master of many tongues, being well versed in classics, and able to converse in the modern languages. Above all, he was eminently a good man, and, like so many physicians, was as a friend and father to his patients, many of whom (especially those of the poorer class) share with his relations the sorrow of his loss.

FAREWELL PRESENTATION TO A HOUSE-SURGEON OF THE ROYAL INFIRMARY.—At the end of the winter session, a meeting was held, by the clinical clerks and dressers in Dr Bell's wards, for the purpose of presenting Mr A. Watson Milne, their house-surgeon, with a testimonial on the occasion of his leaving. Mr Montgomery, who was called to the chair, expressed his gratification at the pleasant duty he had to perform. He thanked Mr Milne, on the part of those present, for his uniform courtesy and kindness, and finally requested his acceptance of a handsome case of Surgical Instruments, bearing a suitable inscription. The speaker was frequently applauded.

Mr Milne replied in a short but very feeling speech. We believe Sir William Fergusson to have been the last house-surgeon who received a similar testimonial.

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